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ATLAS OF HIGH RESOLUTION INFRARED SPECTRA OF CARBON DIOXIDE: FEBRUARY 1983 EDITION

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Summary

A long-path, low-pressure laboratory spectrum of carbon dioxide is presented for the spectral region 1830 to 2010 cm^{-1}. The data were recorded at 0.01 cm^{-1} resolution and room temperature with the Fourier transform spectrometer in the McMath solar telescope complex at Kitt Peak National Observatory. A list of positions and assignments is given for the 1038 lines observed in this region. A total of 39 bands and subbands of $^{12}C^{16}O_2$, $^{13}C^{16}O_2$, $^{12}C^{16}O^{18}O$, $^{12}C^{16}O^{17}O$, and $^{13}C^{16}O^{18}O$ were observed.

I. Introduction

This work reports the first phase of a project to obtain CO_2 assignments, high precision line positions and absolute intensities in spectral regions of current interest for atmospheric remote sensing studies. The spectra analyzed to date cover the NO channel bandpass of the Halogen Occultation Experiment (HALOE) [Russell et al., 1977]. This same spectral region near 5 μm has been selected for NO retrievals from high-resolution spectra obtained during the Balloon Intercomparison of Stratospheric Remote Sensors planned through NASA's Upper Atmospheric Research Program. Numerous CO_2 lines have also been identified in this region in long-path, high-resolution solar absorption spectra obtained with ground-based and balloon-borne interferometers [Goldman and Blatherwick 1980; Goldman et al., 1982], and it is therefore important to have available accurate line parameters for these weak CO_2 bands for atmospheric transmittance calculations, such as the evaluation of interfering absorption by CO_2 near NO lines for stratospheric paths.

The 1830-2010 cm^{-1} region of a low-pressure, long-path absorption spectrum of carbon dioxide is presented in an atlas format. Line positions and quantum assignments have been derived from the analysis of this spectrum and five additional spectra recorded with lower CO_2 abundance. More than 96 percent of 1038 spectral features marked have been identified as CO_2 transitions or residual atmospheric H_2O lines. The spectral data were obtained at room temperature and high signal-to-noise with the 0.01-cm^{-1} resolution Fourier transform spectrometer in the McMath solar telescope complex at Kitt Peak National Observatory. An expanded discussion of the results of this study, supplemented with absolute intensities derived from a spectral least squares curve fitting procedure, is in preparation.

The 5 μm spectrum of CO_2 is characterized by absorption lines of weak perpendicular ($\Delta\ell = \pm 1$) bands. These bands have intense Q branches and are affected by a strong J-dependent Coriolis perturbation, which enhances the intensities of P-branch lines and reduces the intensities of R-branch lines. For $\Pi \leftarrow \Sigma$ bands, this perturbation introduces a $(1 + \zeta\, m)^2$ multiplying factor into the expression for the rotational dependence of the intensity for individual P and R branch lines [Plyler et al., 1962]. The line intensities in the Q branch of $\Pi \leftarrow \Sigma$ bands are not affected by this Coriolis perturbation. General expressions for the Coriolis intensity perturbation factors for all perpendicular CO_2 bands have been given by Toth [1974].

The authors wish to thank James W. Brault, Rob Hubbard, and Greg Ladd of Kitt Peak National Observatory (KPNO) for their assistance in obtaining the data. Mike Brown of KPNO provided us with the N_2O line positions used to calibrate the spectra. Richard Poppen of Tymshare developed the line position finding algorithm used in the analysis. We thank Linda R. Brown for useful discussions concerning the analysis of Kitt Peak laboratory spectra. Kitt Peak National Observatory is operated by the Association of Universities for Research in Astronomy, Inc., under contract with NSF.

II. Description of the Atlas

The spectral data displayed in the atlas were obtained at 25.3°C with a pressure of 9.857 Torr of CO_2 in a 6-m base path White cell with a total path of 384 m. The gas sample was 99.995 percent minimum purity carbon dioxide purchased from the Matheson Corporation, and during the one hour observing period the pressure and temperature were monitored continuously with a Datametrics model 1174 gauge with a 0-10 Torr head and a thermistor probe. No changes in pressure and temperature were noted during the run. The

measured pressure and temperature values are estimated to be accurate to ≈ 0.2 percent and 0.2 K, respectively. For each scan a total of eight two-sided interferograms have been coadded to increase the signal-to-noise ratio. The unapodized spectral data have been convolved with an instrument function corresponding to an apodization of $[1-(x/x_{max})^2]^2$, where x is the path difference and x_{max} is the maximum path difference (49.055 cm). The experimental conditions for the six spectra analyzed in this study are summarized in Table I.

Figure 1 is a compressed plot of the data shown in the atlas. The upper envelope of the spectrum is relatively flat for wavenumbers above 1870 cm^{-1}; but at lower wavenumbers, there is a rapid decrease in signal with decreasing wavenumber. This effect results primarily from the decreased sensitivity of the InSb detector in this spectral region. The signal-to-RMS noise ratio ranges from ≈ 2000 at 1850 cm^{-1} to ≈ 4000 for data above 1900 cm^{-1}. The filter used to isolate the observed spectral region caused two weak channel spectra with amplitudes of ≈ 0.1 percent transmittance and periods of 0.29 and 0.59 cm^{-1} in all scans.

Although the 12 meters of path within the interferometer were evacuated, the external path between the exit port of the White cell and the FTS (about 10 meters) had to be purged with dry nitrogen to reduce atmospheric absorption. This external path gave rise to broad absorption lines of H_2O in the spectra. As can be seen in the atlas, the broad H_2O absorption profile is superimposed on a narrow component, which indicates that additional absorption by H_2O molecules occurred at low pressure within the FTS and the White cell. For some of the weaker H_2O lines, only the narrow component can be detected in the spectra. The water vapor lines were identified using the line lists of Flaud, Camy-Peyret, and Toth [1981] and Guelachvili [1983]. No other contaminants were identified in the data.

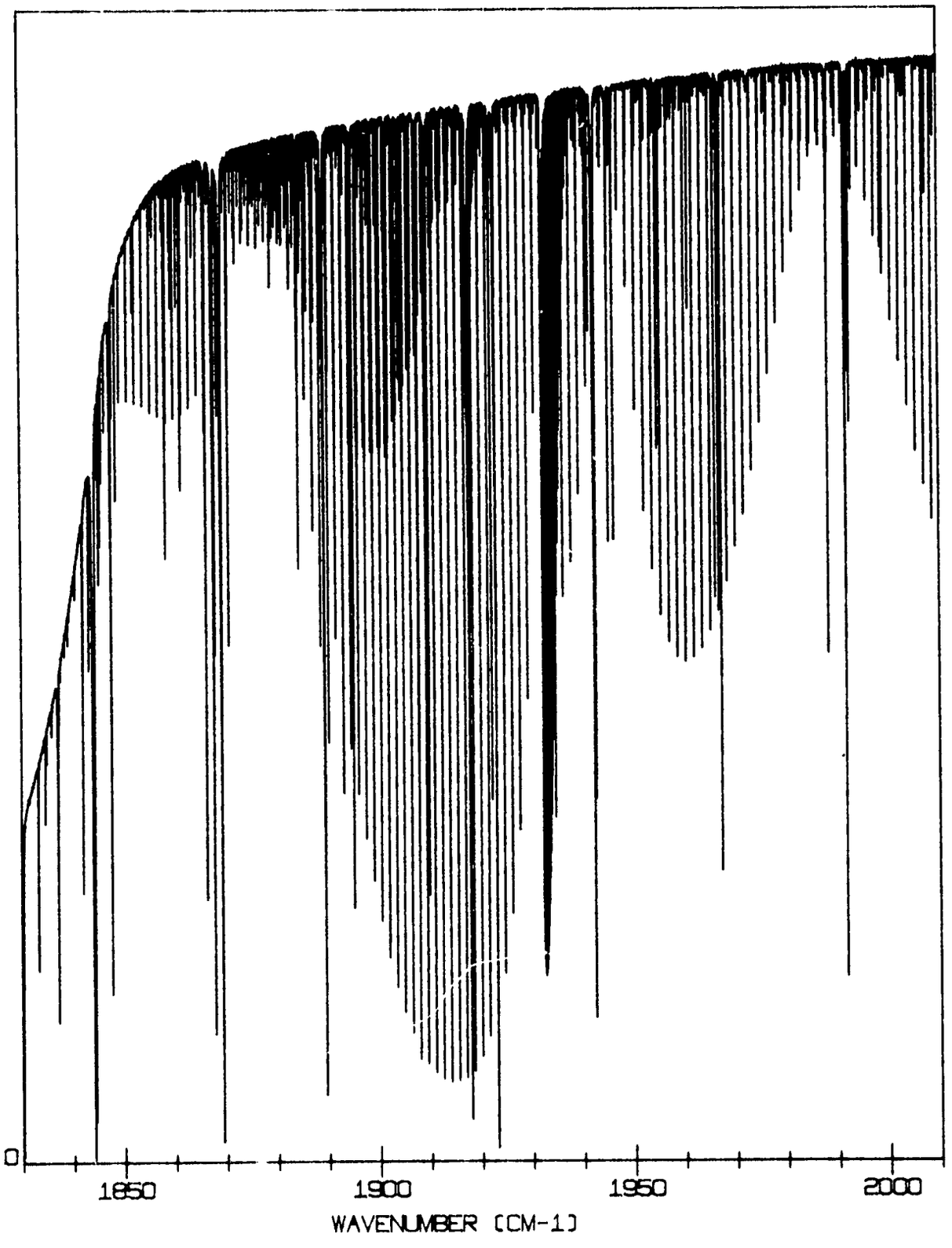

Fig. 1 - Compressed plot of the atlas spectrum.

The observed spectrum is presented in a format similar to that used by Goldman et al. [1982] and Blatherwick et al. [1982] to display atmospheric spectra. In this atlas, each frame shows a 2-cm^{-1} interval of the observed spectrum and the opposite page contains the observed and calculated line positions and the molecular identifications. Each frame also contains a 0.2-cm^{-1} overlap of spectral data at the high and low wavenumber ends. Because of the change in the amplitude of the signal with wavenumber, the amplitudes have been normalized to a different value for each frame. The zero signal level is marked at the lower left. The locations of the observed spectral lines are indicated below the features by vertical tick marks, which are repeated and numbered consecutively at the top of each frame.

Each observed line position is the weighted average of measurements obtained from one to six spectra including the spectrum shown in atlas format in this report. The individual position measurements were made interactively with the HALOE HP-1000 dedicated mini-computer system. For each measurement, the appropriate section of spectrum is displayed on a graphics terminal and the user specifies an intensity level below which the spectral data are used to determine the line center. The spectrum in this interval is interpolated with a sinc function to a point spacing of $\approx$ 0.001 cm^{-1}, and the position of the intensity minimum of the spectral line is then found from parabolic interpolation of the minimum intensity interpolated point and single adjacent points on the high and low wavenumber sides. Additional measurements of the line center are determined by taking the midpoint between the interpolated sides of the spectral line at the user specified intensity level and at 14 evenly spaced intensity levels between this level and the minimum intensity. The total of 16 positional determinations are then averaged and the standard deviation is calculated. A line is least-squares fit to the intensities and

positions of the 16 points, and the reciprocal of the slope of this line is used as a measure of the symmetry and intensity of the spectral line. The reciprocal of the product of the square root of this quantity and the standard deviation of the line center determinations has been used as a weight in the position determination. The observed line positions listed in the atlas are the weighted average of the determinations from all spectra. The sum of the individual weights has been assigned to this position and used in the least-squares fitting for the molecular constants (section III).

The absolute calibration of the wavenumber scale is based on N_2O line positions for the R3 to R27 lines of the $00^02\text{-}00^00$ band. These positions were derived from spectra recorded with the Kitt Peak interferometer and calibrated with the frequency of the 3.39-μm P(7) transition of CH_4 [Evenson et al., 1973]. Secondary CO_2 standards were established near 2050 cm^{-1} from a broadband spectrum of CO_2 and N_2O. These secondary standards have been used to calibrate each of the CO_2 spectra used in this study. We compared the consistency of CO_2 positions near 4 μm with the recent high precision measurements of Pine and Guelachvili [1980] and Guelachvili [1980]. The wavenumbers reported in this atlas may be transferred to a scale consistent with the measurements in these papers by multiplying by 1.0000002. This difference ($\approx$ 0.0004 cm^{-1} at 1900 cm^{-1}) is under study. For isolated lines, the self-consistency of the measured positions from the six Kitt Peak spectra is typically $\pm$ 0.00002 cm^{-1} for the strongest lines and $\pm$ 0.001 cm^{-1} for most weak lines. Based on the few available measurements [Freed and Javan, 1970; Arcas et al., 1980], we estimate that pressure-induced lineshifts in these spectra near 5 μm are generally less than $\pm$ 0.00002 cm^{-1}.

The CO_2 identifications are presented in the same format as appear on the Air Force Geophysics Laboratory line compilation [Rothman 1981; Rothman and Young 1981]. The energy levels are describe by ($v_1v_2\ell v_3r$), where the ranking index, r, is unity for the highest energy vibrational level of a Fermi resonating group. The ranking index can assume values of 1, 2, . . , (v_1+1). The other quantum numbers have their standard meaning: v_1, v_2, and v_3 are the quantum numbers for the three CO_2 vibrational modes, and ℓ is the vibrational angular momentum about the internuclear axis. The vibrational quantum numbers are given for the upper and lower levels and are followed by the rotational assignment and a three digit isotope code (626 = $^{12}C^{16}O_2$; 636 = $^{13}C^{16}O_2$; 628 = $^{12}C^{16}O^{18}O$; etc.) In those cases in which there are multiple identifications, the assignments are given in order of their relative contribution to the observed feature in the spectrum displayed in the atlas. Features identified as residual lines of water vapor are indicated as "H_2O". Identifications that are uncertain are marked with question marks, while features that seem to be too strong or too broad to be due to only the assigned transition are indicated with a question mark on an additional line in the identification column. An effort has been made to avoid marking features which are sidelobes of the interferometric line shape rather than real lines. Lines which are believed to be real but are blended with a sidelobe of an adjacent stronger line are marked with "sidelobe" in addition to the identification, to denote this blending and the reduced accuracy of the measured line center for the transition.

An effort has been made to mark all observable features with line center depths greater than about 0.2 percent of the background intensity. Because of the high signal-to-noise ratio of the data, many additional weaker lines are detectable in the spectra but have not been included in our analysis. For the

atlas (highest CO_2 abundance) spectrum, the weakest CO_2 lines marked have an intensity at room temperature of ≈ 0.5 X 10^{-26} cm/molecule.

III. Assignments and Calculation of Line Positions

The carbon dioxide assignments were made on the basis of comparisons between the observed line positions and intensities and values calculated with the parameters from the 1980 Air Force Geophysics Laboratory compilation [Rothman 1981; Rothman and Young 1981], supplemented with the molecular constants calculated by Chedin [1979]. For most bands, these molecular constants produced predicted line positions for low-J lines within 0.1 cm^{-1} of the measured positions, and it was possible tc readily assign the proper sequence of lines by comparisons between the observed and calculated positions. The assignments were checked by examining the relative intensities of the lines and by comparison of the measured combination differences with well-determined values [cf., Bailly et al. 1981]. Positions for a band or subband were least-squares fit to a polynomial in $\underline{m}$, where $\underline{m}$ = J"+1 for the R branch and $\underline{m}$ = -J" for the P branch, or to a polynomial in J"(J"+1) for Q branch lines. All unblended lines were used in the weighted least-squares fit. The positions of lines outside the range of measurements were calculated with the polynomial coefficients. These calculated positions were used to identify additional lines which resulted in improvement in the determination of the polynomial coefficients. This process was repeated until no additional lines were detected in the spectra. The calculated positions presented in the atlas were obtained from these polynomial coefficients.

Table II lists 23 bands and subbands of $^{12}C^{16}O_2$ identified in the spectra, approximate positions for the band centers, and the range of unblended rotational transitions observed in this study. Isotopic bands and subbands are tabulated in the same format in Table III. A number of the bands have rotational transitions outside of the spectral interval reported in the

atlas. For these cases, the rotational transitions which mark the limits of the coverage are enclosed in parentheses. "NC" denotes that the entire branch occurs beyond the region in the atlas. The positions of these lines will be reported in subsequent installments of the atlas. For bands near the limit of detection, the rotational coverage is incomplete. Because of the strong Coriolis perturbation of the line intensities, a number of R-branch lines of intermediate J-values are also absent for the weaker bands. "ND" denotes that all lines of the branch are very weak and were not observed in the highest abundance Kitt Peak spectrum; a dash indicates the transition is forbidden.

Our study shows five bands in the laboratory spectra which need to be added to the Air Force Geophysics Laboratory atmospheric line parameter compilation. The P56-P66 lines of the (21102)←(10002) band of $^{12}C^{16}O_2$ and the P54-P61 lines of (12201)←(01101) band of $^{13}C^{16}O_2$ were identified near the high wavenumber limit of the atlas; lower-J lines are prominent absorption features in the 2030-2070 cm^{-1} region of the Kitt Peak laboratory spectra. Several weak lines near 2000 cm^{-1} have also been assigned to the $^{13}C^{16}O_2$ (21102)←(10002) band. A total of 27 unblended lines of the P and Q branches of the (11102)←(00001) band of $^{12}C^{16}O^{17}O$ have been identified in the data; however, the R branch is weak and no lines were observed. A series of weak lines have been assigned as P-branch transitions of the (11101)←(00001) band of $^{13}C^{16}O^{18}O$. This identification has been verified by examining Kitt Peak laboratory spectra of a ^{13}C- and ^{18}O-enriched sample of carbon dioxide. The observed positions and intensities will be forwarded to the Air Force Geophysics Laboratory for inclusion in future compilations.

Because the fitting procedure used in this preliminary analysis of the spectra does not result in the most accurate determination of the molecular constants possible from the data, the values are not presented in this report

but may be obtained from the authors. Molecular constants derived from a fitting procedure that includes simultaneously all unblended transitions involving several connected vibrational levels will be presented in subsequent installments of the CO_2 atlas, when additional regions of the Kitt Peak data have been analyzed. Work is in progress on the 2010-2100 cm^{-1} region.

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Table I

Experimental Conditions

Pressure (Torr)	Temperature (°C)	Path Length (m)
1.000	24.3	24
1.001	24.0	48
0.992	25.2	144
1.000	25.4	384
3.000	25.2	384
9.857	25.3	384

Table II

$^{12}C^{16}O_2$ Bands and Subbands Observed in the Region 1830-2010 cm^{-1}

Transition		Band Center	Range of Measurements		
Upper	Lower	(cm^{-1})	P branch	R branch	Q branch
21103c	02201c	1846	ND	R20 - R38	-
21103d	02201d	1846	ND	R21 - R35	-
20003	01101c	1880.99	P 3 - P65	R11 - R67	-
20003	01101d	1880.99	-	-	Q26 - Q52
21103c	10002	1896.06	P 6 - P56	R20 - R46	-
21103d	10002	1896.06	-	-	Q12 - Q34
13302c	02201c	1905.49	P18 - P46	R26 - R34	-
13302d	02201d	1905.49	P13 - P45	R 3 - R45	-
13302d	02201c	1905.50	-	-	Q12 - Q46
13302c	02201d	1905.49	-	-	Q11 - Q45
12202c	01101c	1917.64	P 3 - P69	R 7 - R65	-
12202d	01101d	1917.64	P 4 - P68	R 2 - R66	-
12202d	01101c	1917.64	-	-	Q21 - Q55
12202c	01101d	1917.64	-	-	Q14 - Q50
11102c	00001	1932.47	P 2 - P82	R 8 - R80	-
11102d	00001	1932.47	-	-	Q 6 - Q74
21102c	10001	1951.17	P 4 - P50	R 6 - R10	-
21102d	10001	1951.17	-	-	Q 6 - Q48
20002	01101c	2003.76	P 3 - P55	R 3 - (R7)	-
20002	01101d	2003.76	-	-	Q 2 - Q40
21102c	02201c	2005	P12 - P30	NC	-
21102d	02201d	2005	P11 - P33	NC	-
21102c	10002	2054	(P56)- P66	NC	-

Notes: NC - branch not in spectral interval.
ND - branch not detected in spectra.

Table III

$^{13}C^{16}O_2$, $^{12}C^{16}O^{18}O$, $^{12}C^{16}O^{17}O$, and $^{13}C^{16}O^{18}O$ Bands and Subbands Observed in the Region 1830 - 2010 cm^{-1}

Transition Upper	Transition Lower	Isotope Code	Band Center (cm^{-1})	Range of Measurements P branch	R branch	Q branch
12202c	01101c	636	1883	P21 - P31	ND	-
12202d	01101d	636	1883	P24 - P34	ND	-
11102c	00001	636	1896.54	P 4 - P60	R 4 - R56	-
11102d	00001	636	1896.54	-	-	Q 8 - Q42
11102c	00001	628	1901.74	P 4 - P59	R26 - R39	-
11102d	00001	628	1901.74	-	-	Q11 - Q47
11102c	00001	627	1916.67	P15 - P42	ND	-
11102d	00001	627	1916.67	-	-	Q10 - Q24
20002	01101c	636	1996.59	P 7 - P47	NC	-
20002	01101d	636	1996.58	-	-	Q 6 - Q34
11101c	00001	638	2005	P15 - P29	ND	-
21102c	10002	636	2024	(P18) - P34	NC	-
11101c	00001	636	2037	(P36) - P74	NC	-
11101c	00001	628	2049	(P56) - P63	NC	-
12201c	01101c	636	2052	(P57) - P61	NC	-
12201d	01101d	636	2052	(P54) - P60	NC	-

Notes: NC - branch not in spectral interval.
ND - branch not detected in spectra.

TABLE A1

Line Positions and Identifications (1830-1832 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1830.13203		H2O	
2	1831.49135		?	
3	1831.54874	1831.54847	20003-01101 626	P65
4	1831.99211		H2O	

FRAME A1

9.857 Torr 384 meters

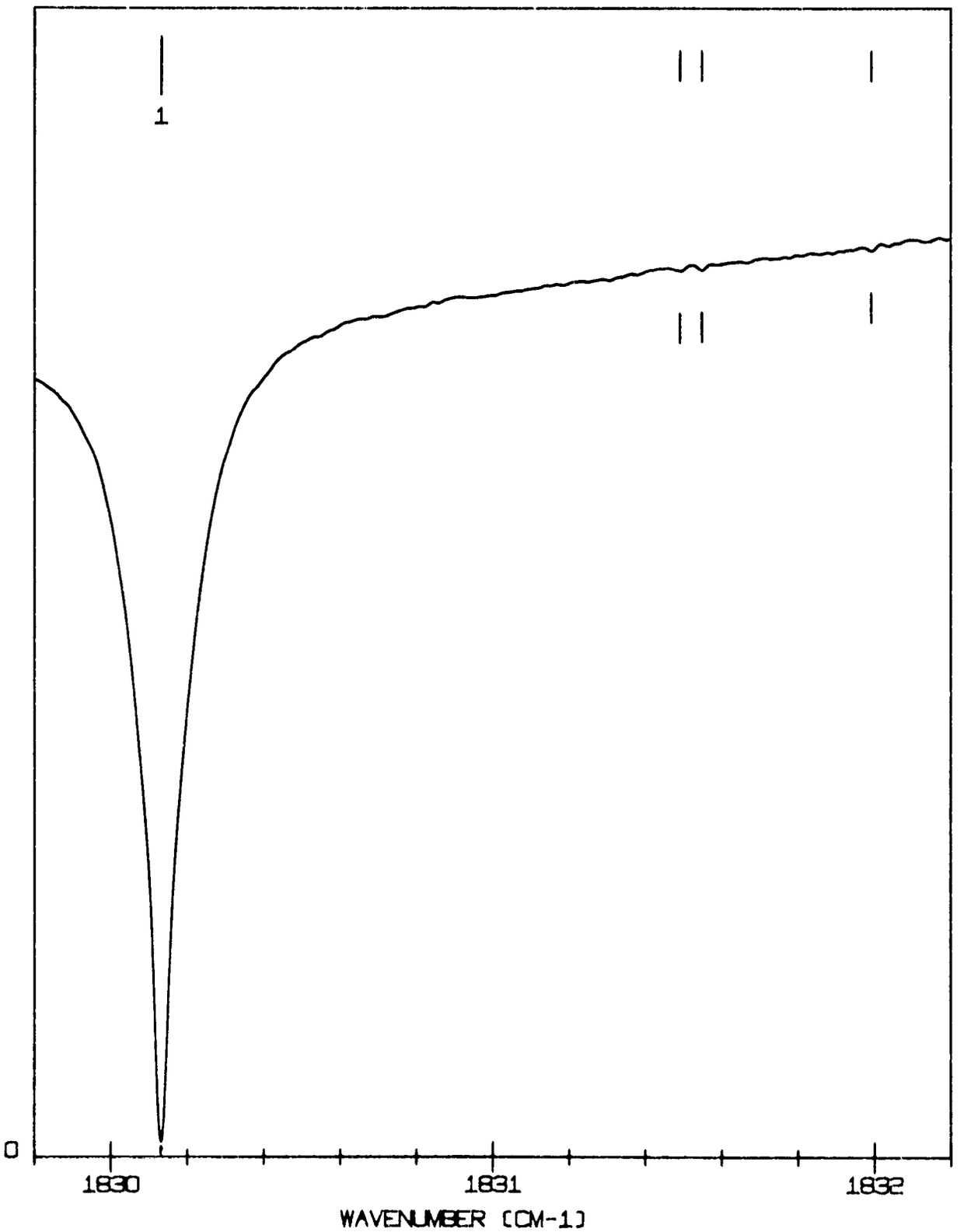


TABLE A2

Line Positions and Identifications (1832-1834 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1832.26709		H2O	
2	1833.06484	1833.06629	20003-01101 626	P63
3	1833.27940		H2O	

FRAME A?

9.857 Torr 384 meters

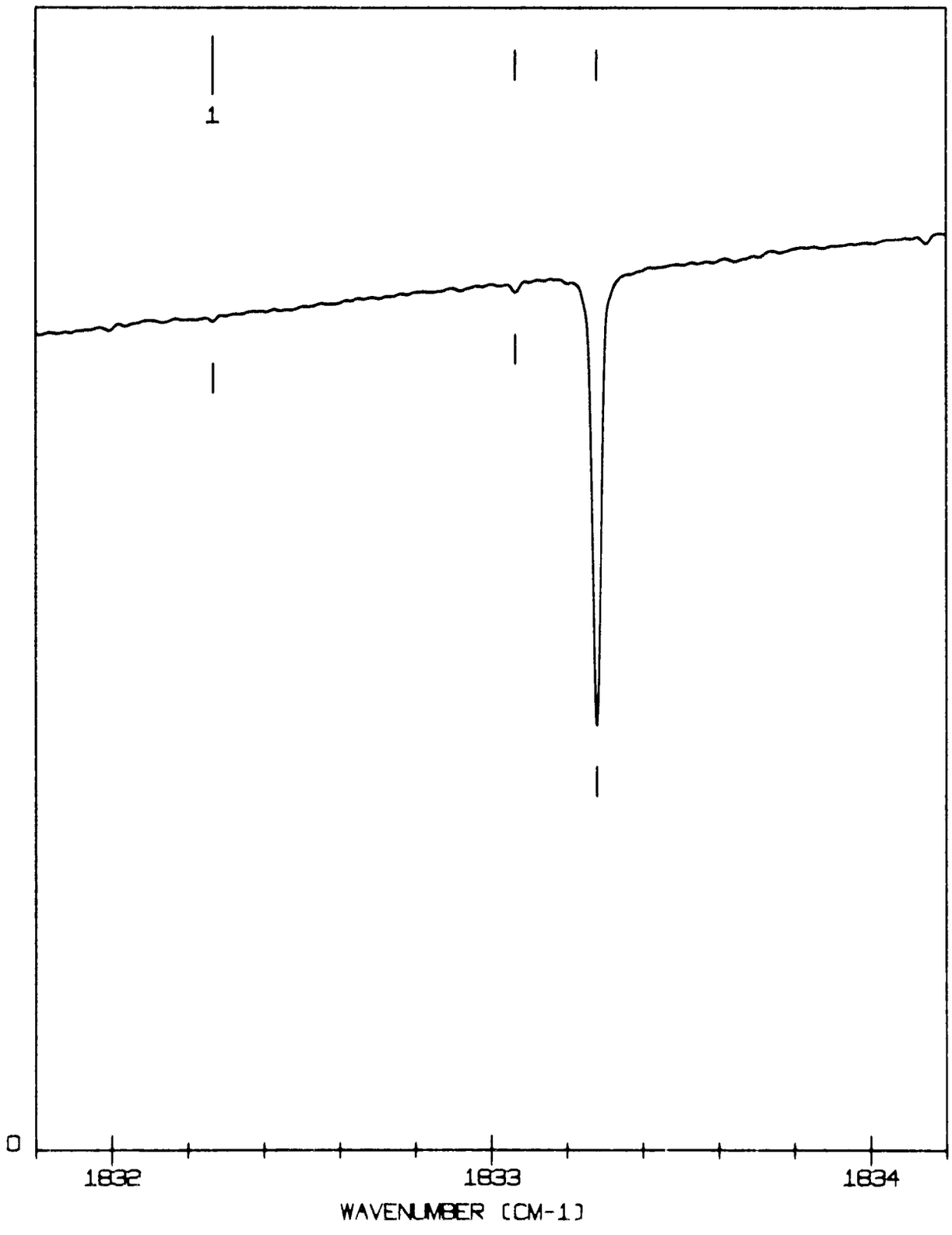


TABLE A3

Line Positions and Identifications (1834-1836 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1834.14747		H2O	
2	1834.58092	1834.58100	20003-01101 626	P61
3	1834.70101		H2O	
4	1834.77935		H2O	
5	1834.93462		H2O	
6	1835.89328		H2O	

9.357 Torr 884 meters

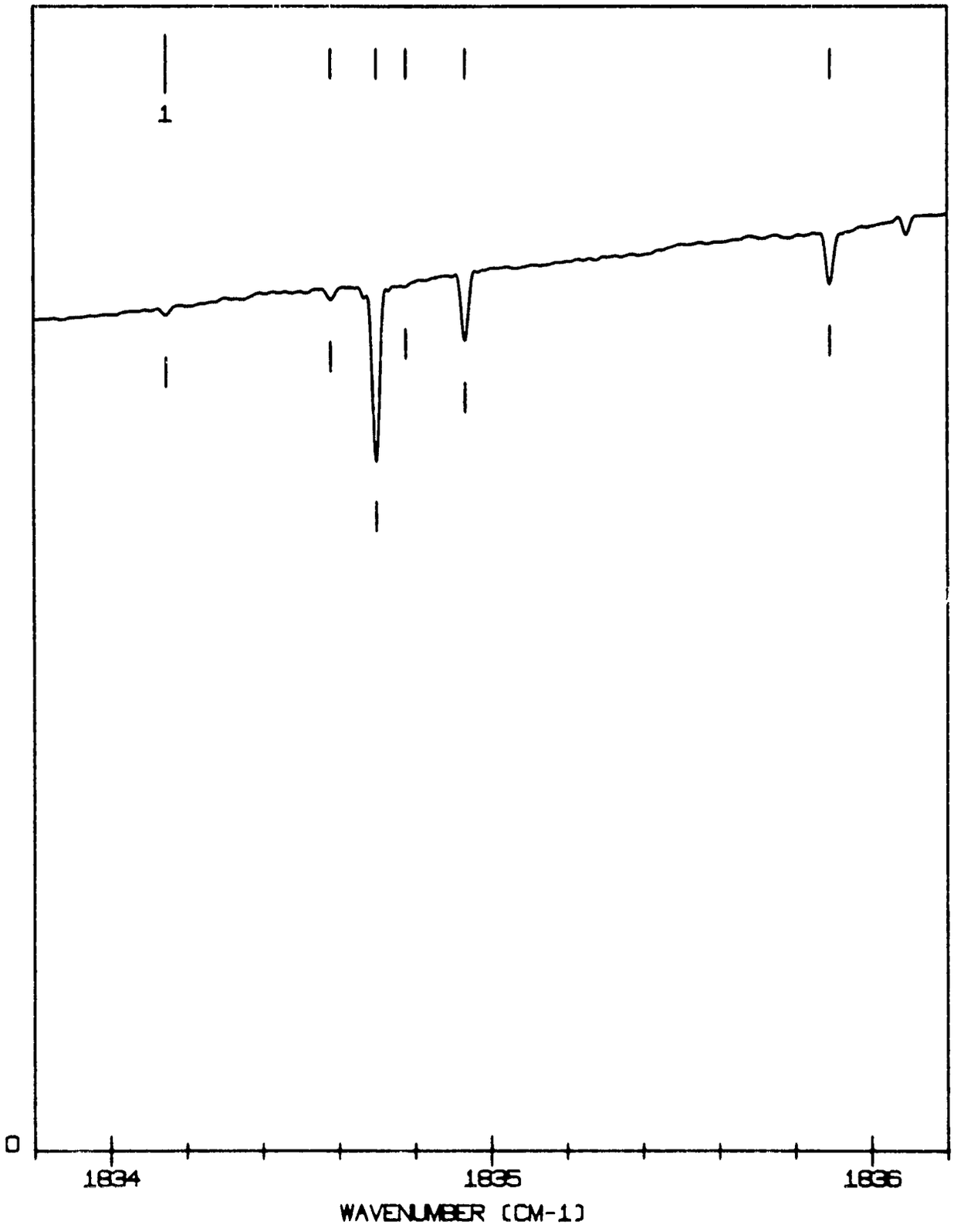


TABLE A4

Line Positions and Identifications (1836-1838 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1836.09325	1836.09301	20003-01101 626	P59
2	1837.18078		H2O	
3	1837.35998		H2O	
4	1837.60191	1837.60270	20003-01101 626	P57
5	1837.79000		?	

FRAME A4

9.857 Torr 384 meters

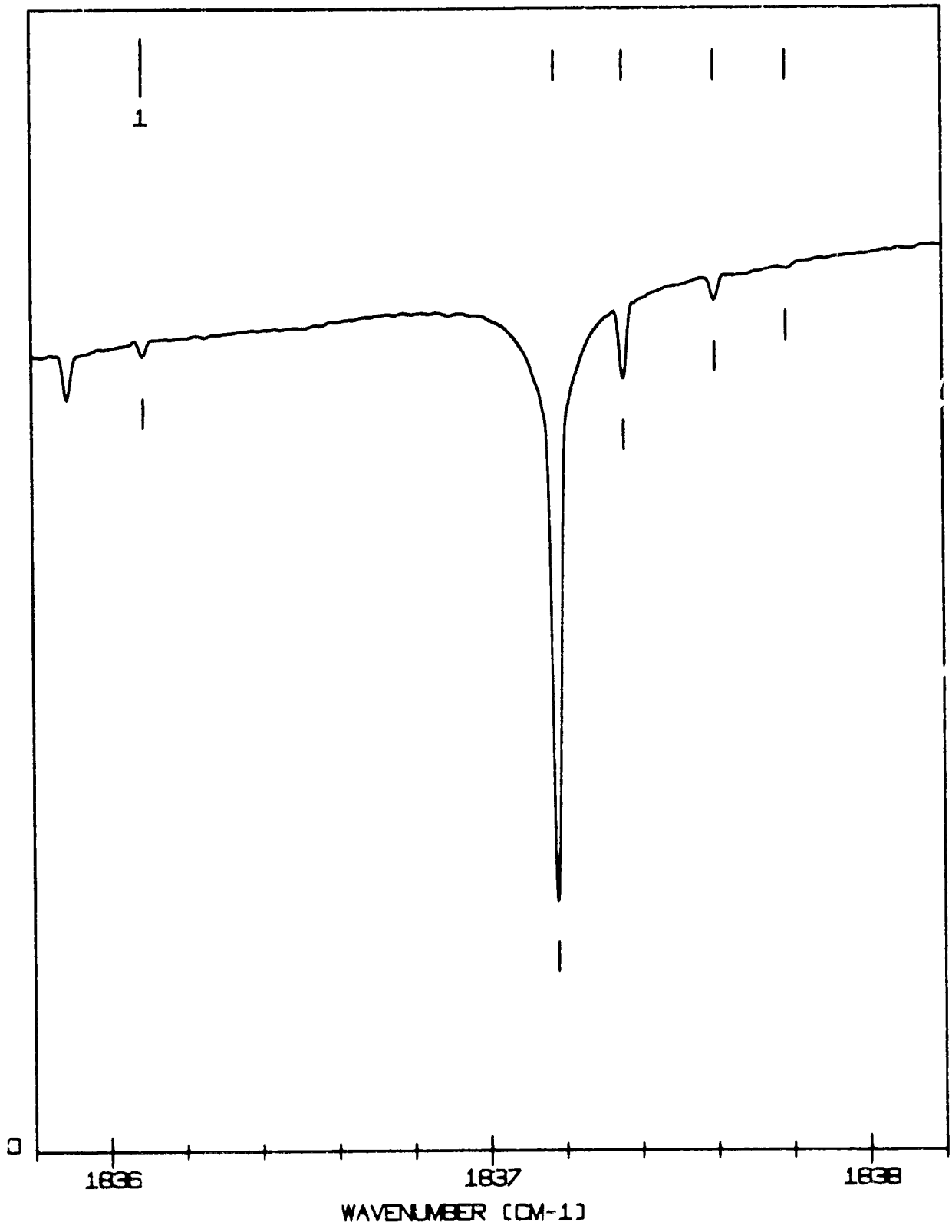


TABLE A5

Line Positions and Identifications (1838-1840 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1838.46802		H2O	
2	1839.11062	1839.11046	20003-01101 626	P55
3	1839.16000		H2O	
4	1839.32415		H2O	
5	1839.39050		H2O	

FRAME A5

9.857 Torr 384 meters

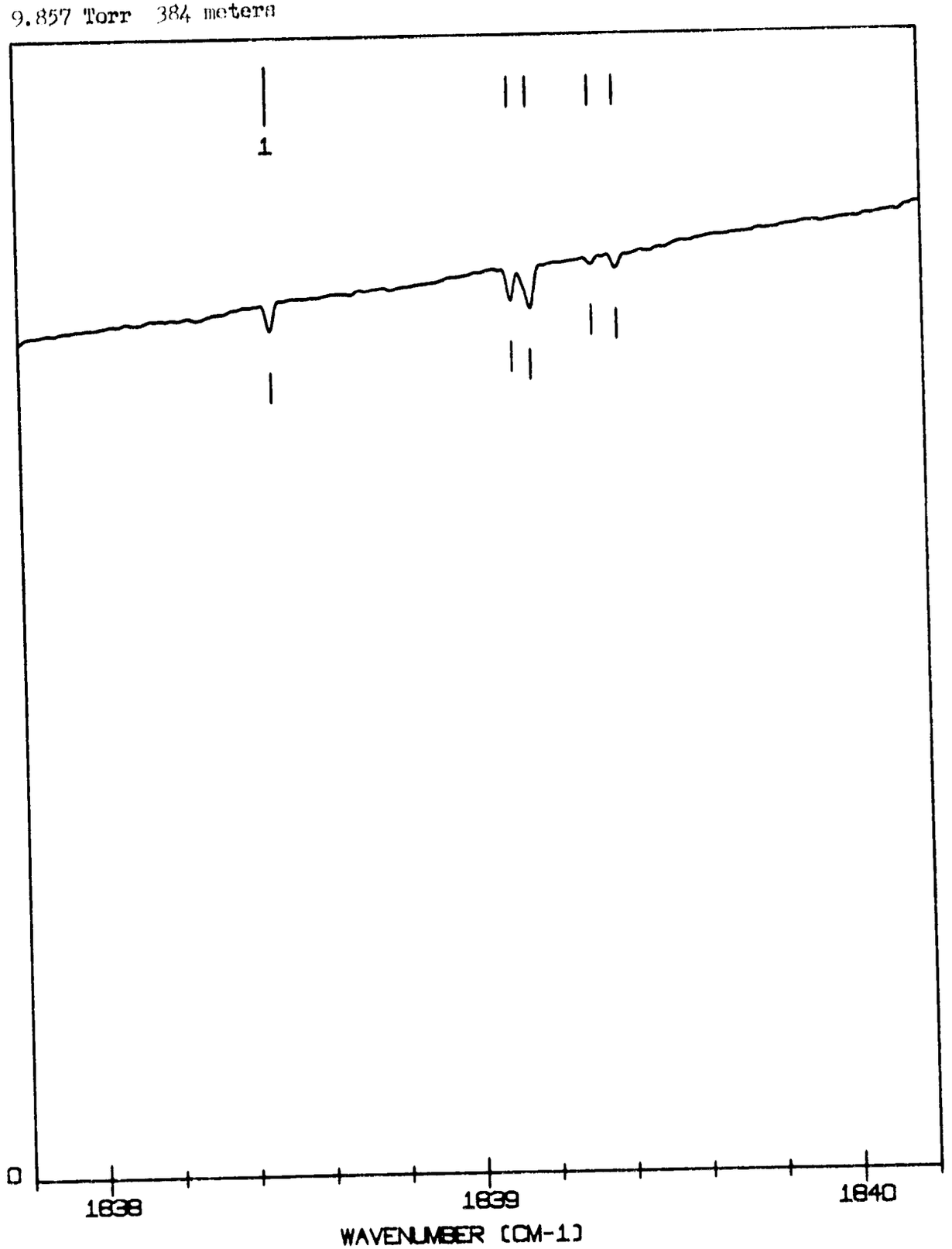


TABLE A6

Line Positions and Identifications (1840-1842 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
			H_2O	
1	1840.29655		26003-01101 626	P53
2	1840.61644	1840.61668		

FRAME A6

0.257 Torr 8¼ meters

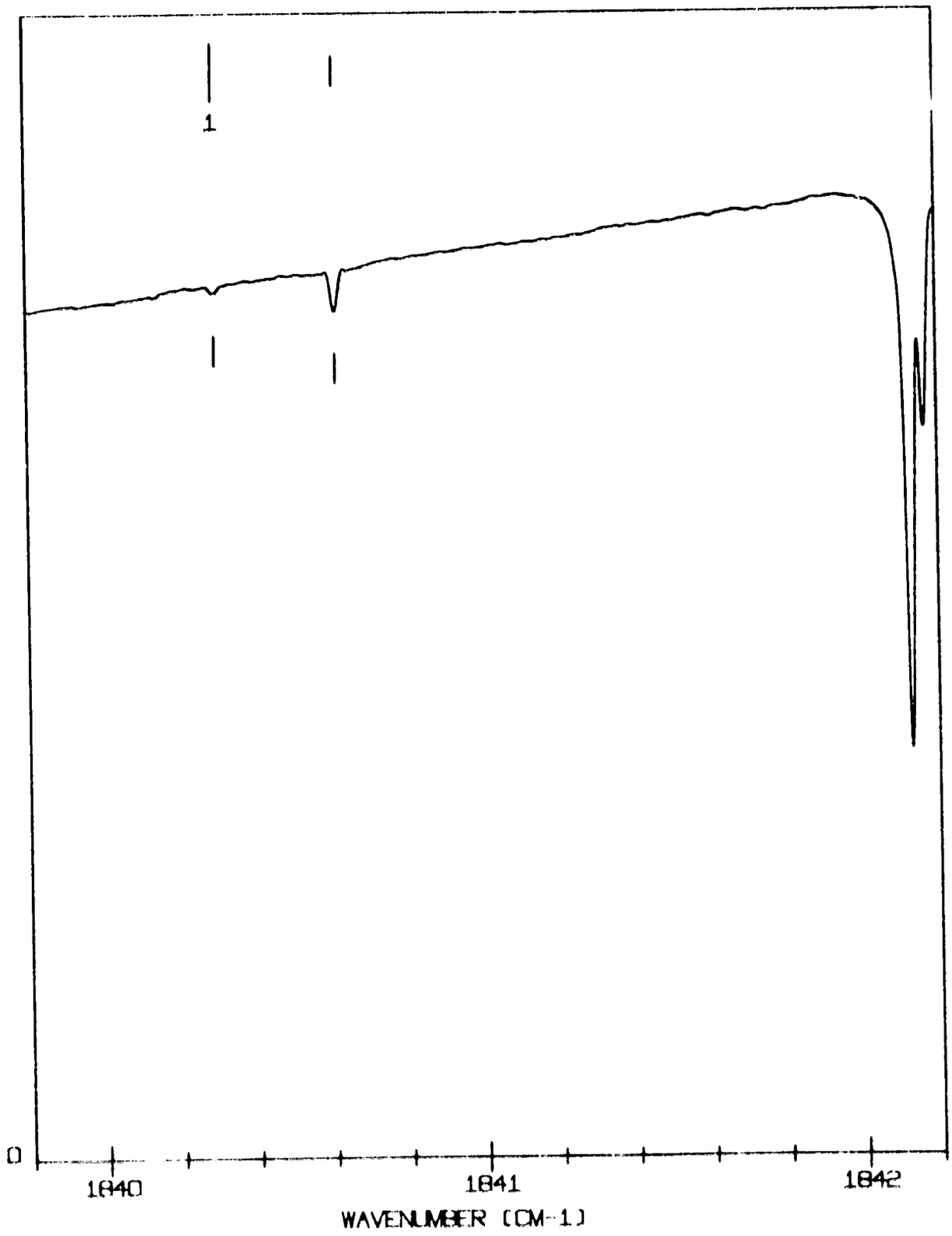


TABLE A7

Line Positions and Identifications (1842-1844 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1842.12974		H2O	
		1842.12172	20003-01101 626	P51
2	1842.16565		H2O	
3	1842.85049		H2O	
4	1843.39431		H2O	
5	1843.62599	1843.62594	20003-01101 626	P49
6	1843.71591		H2O	

FRAME A7

9.857 Torr 384 meters

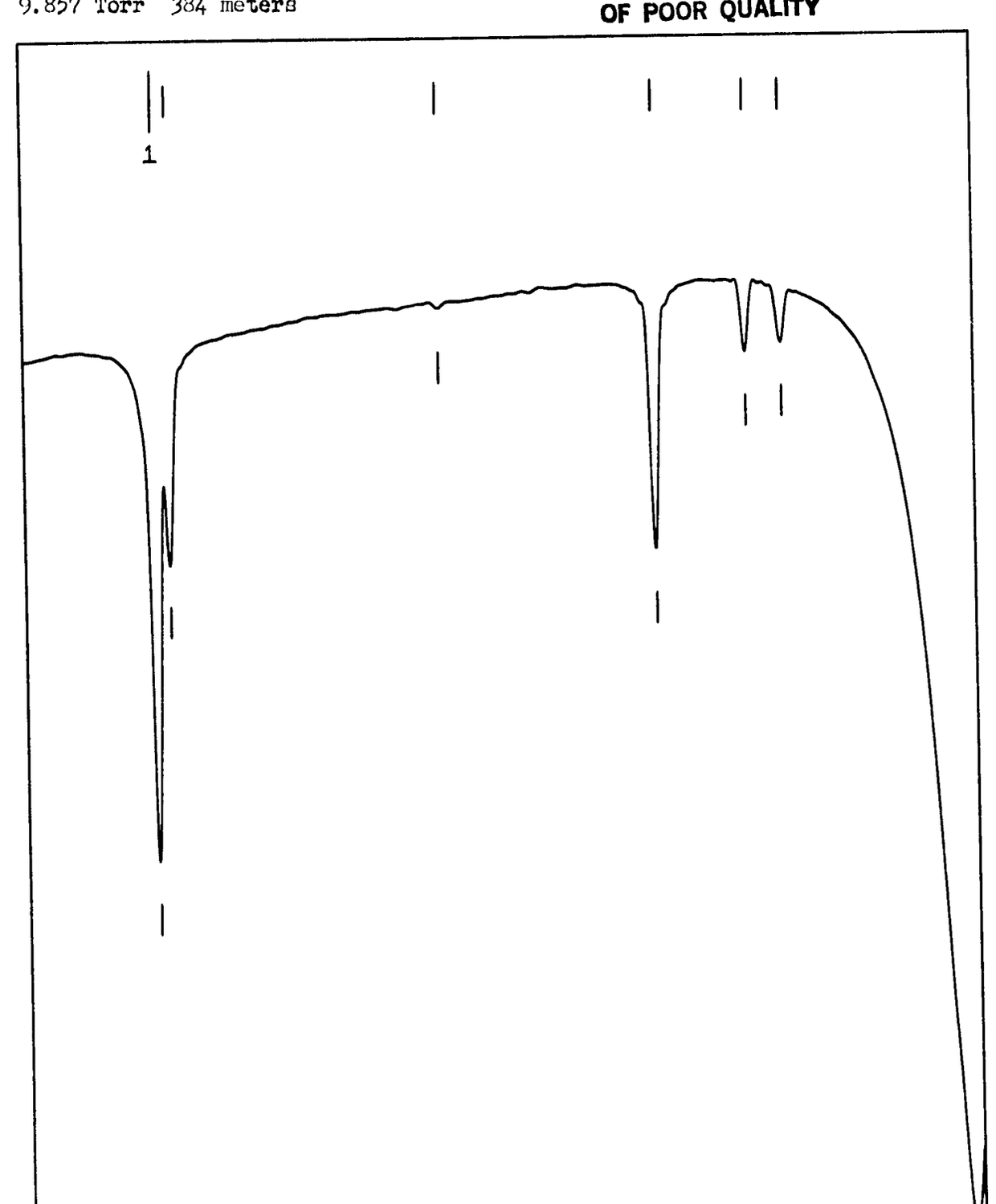


TABLE A8

Line Positions and Identifications (1844-1846 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1844.17986		H2O	
2	1844.39852		H2O	
3	1845.12966	1845.12970	20003-01101 626	P47
4	1845.23044		H2O	
5	1845.33012		H2O	
6	1845.36348		H2O	
7	1845.59770		H2O	
8	1845.78354		H2O	
9	1845.95569		H2O	
10	1845.98652		H2O	

FRAME A8

0.857 Torr 384 meters

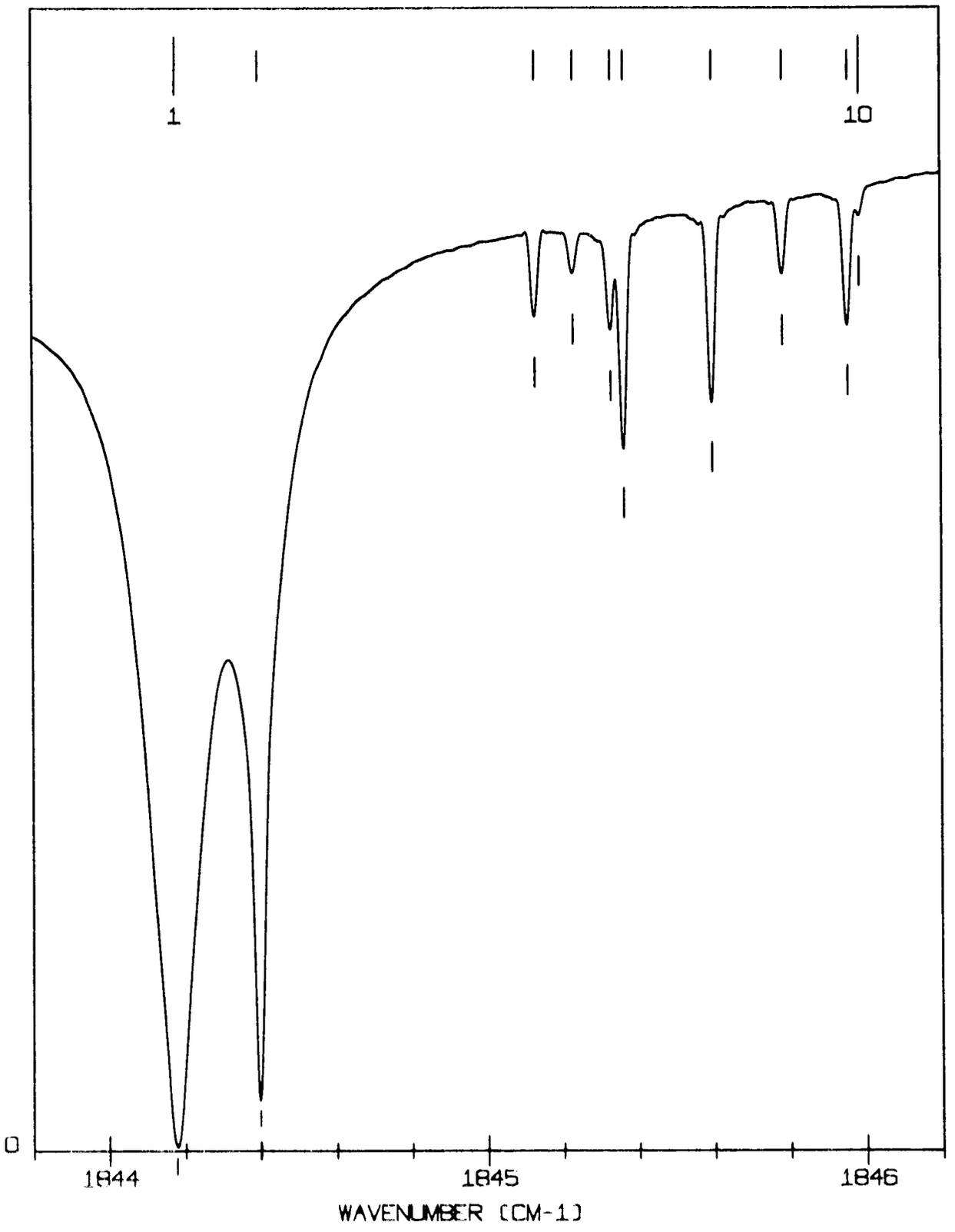


TABLE A9

Line Positions and Identifications (1846-1848 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1846.63336	1846.63333	20003-01101 626	P45
2	1847.37887		H2O	
3	1847.54740		H2O	
4	1847.78279		H2O	

FRAME A9

9.857 Torr 384 meters

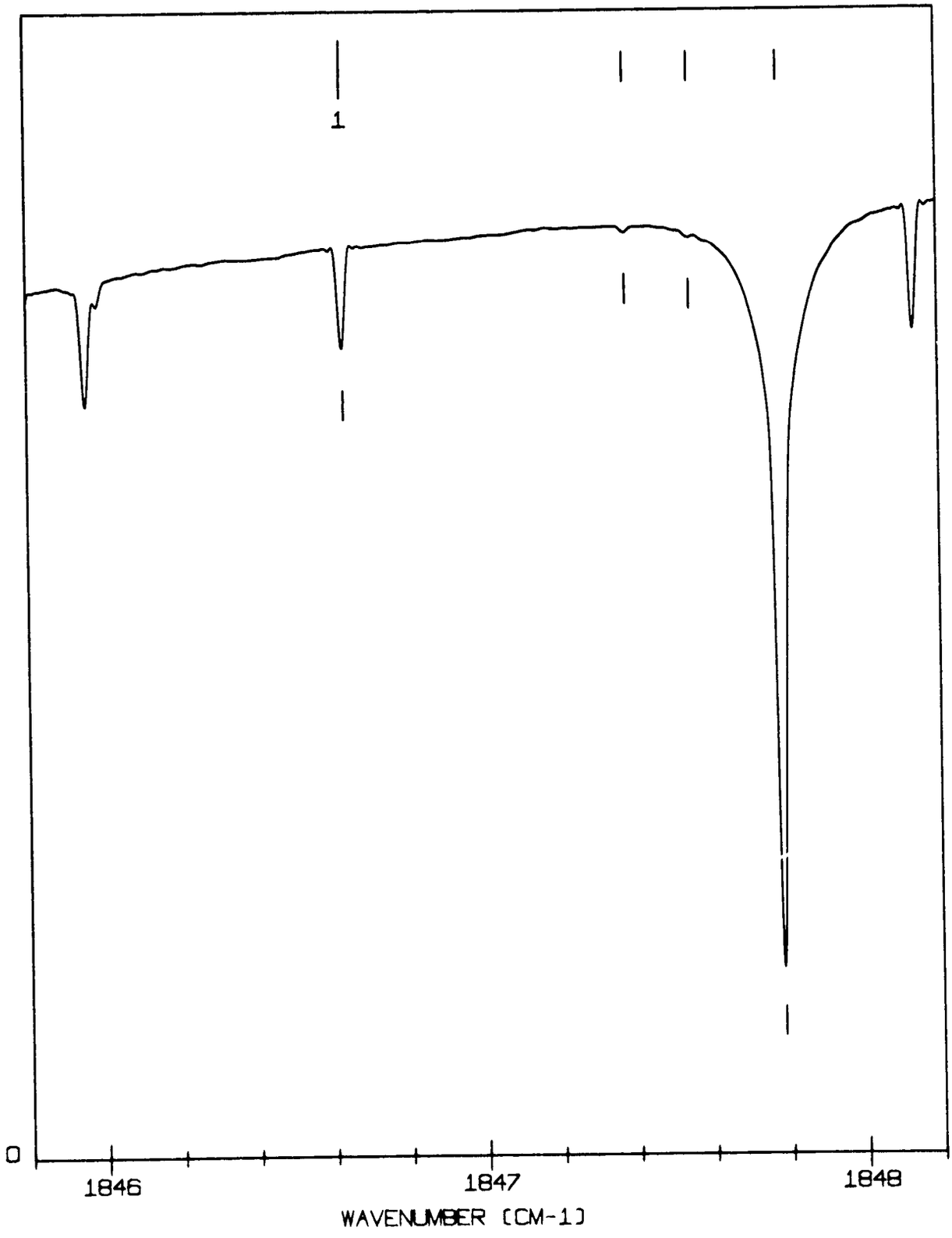


TABLE A10

Line Positions and Identifications (1848-1850 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1848.13702	1848.13717	20003-01101 626	P43
2	1848.81286		H2O	
3	1849.33812		H2O	
4	1849.64149	1849.64153	20003-01101 626	P41
			H2O	

FRAME A10

9.857 Torr 38¼ meters

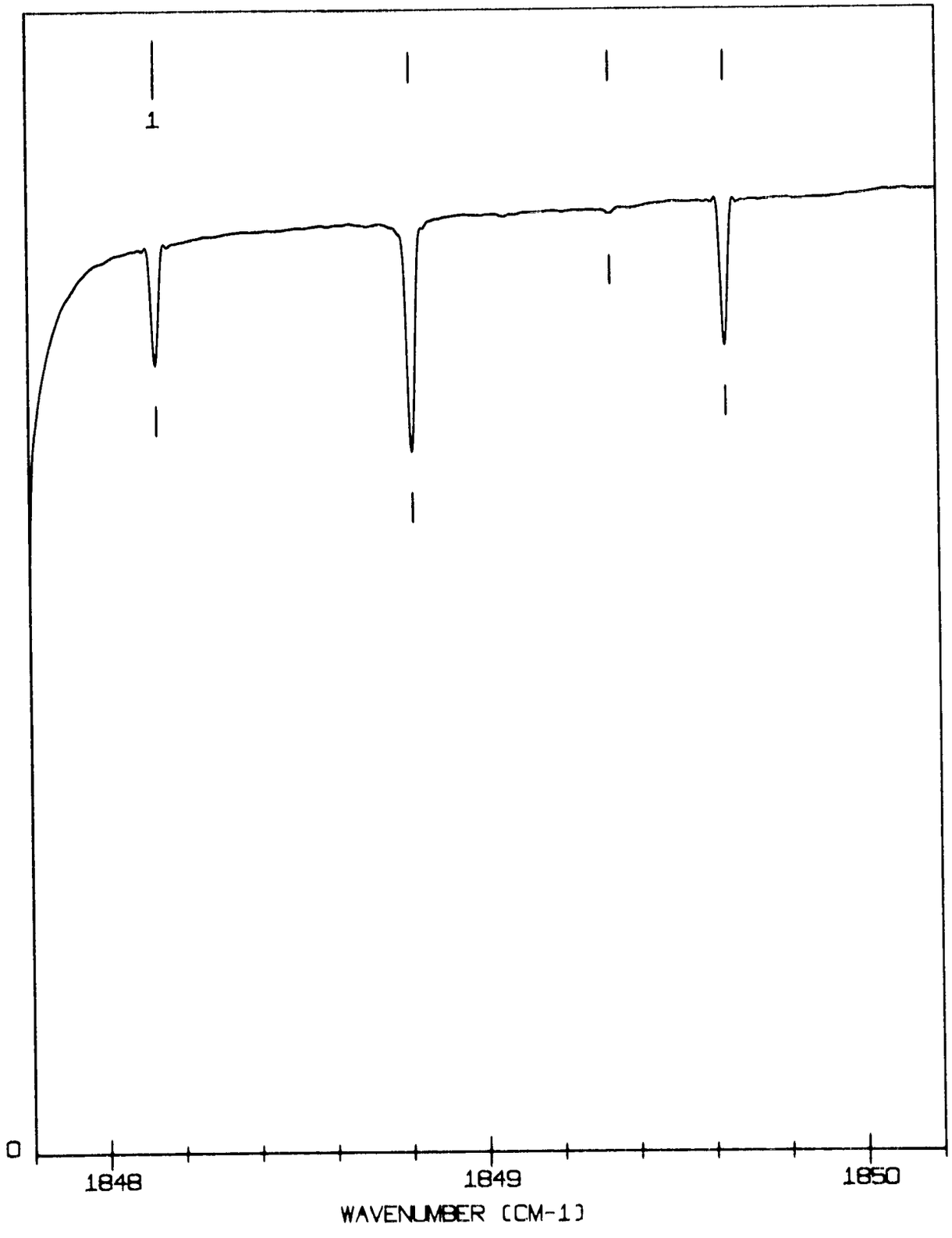


TABLE A11

Line Positions and Identifications (1850-1852 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1851.14673	1851.14672	20003-01101 626	P39

FRAME A11

9.857 Torr 384 meters

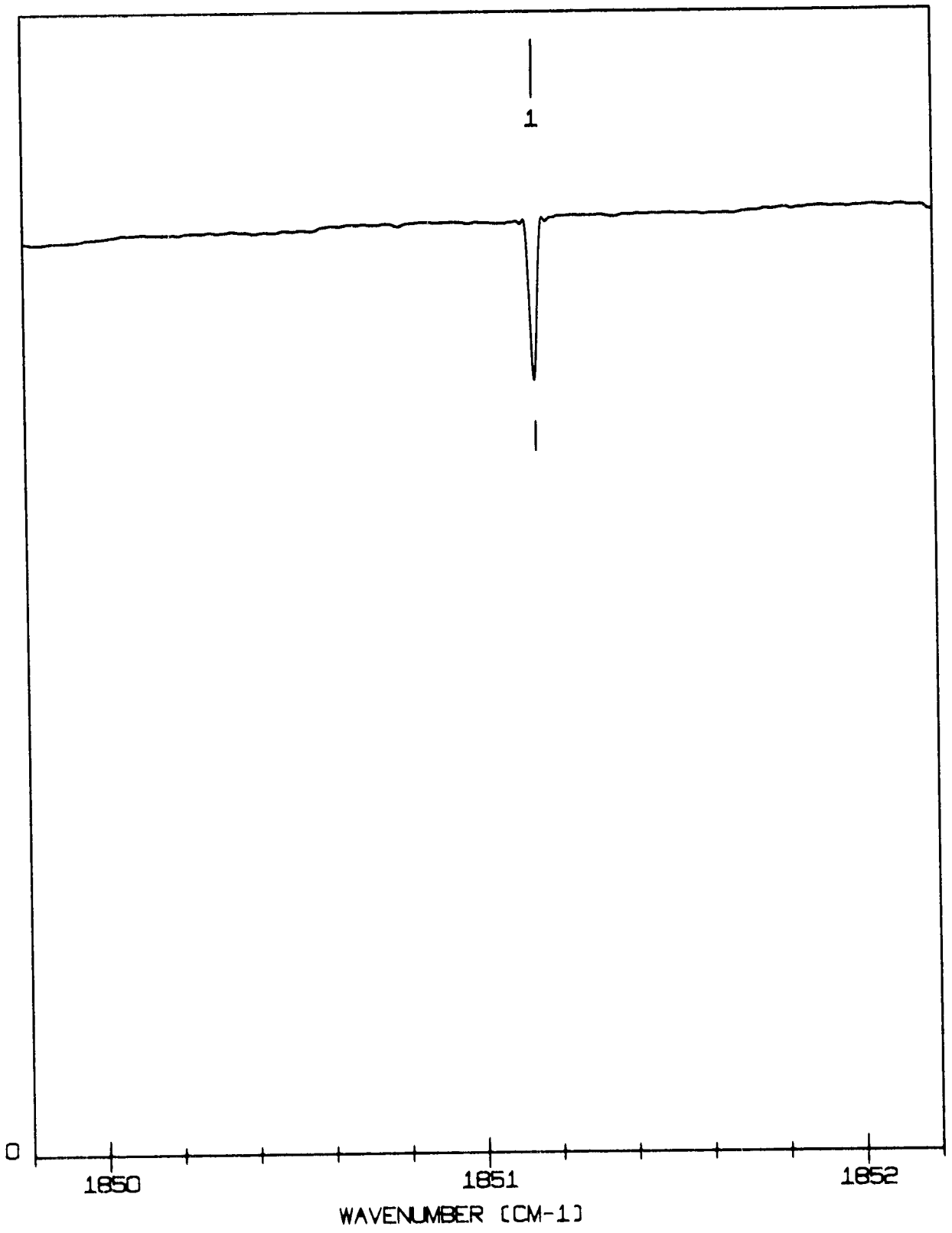


TABLE A12

Line Positions and Identifications (1852-1854 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1852.19536	1852.19397	11102-00001 636	P60
2	1852.40492		H20	
3	1852.65304	1852.65303	20003-01101 626	P37
4	1853.59925	1853.59953	11102-00001 636	P58
5	1853.87471		H20	

FRAME A12

9.857 Torr 384 meters

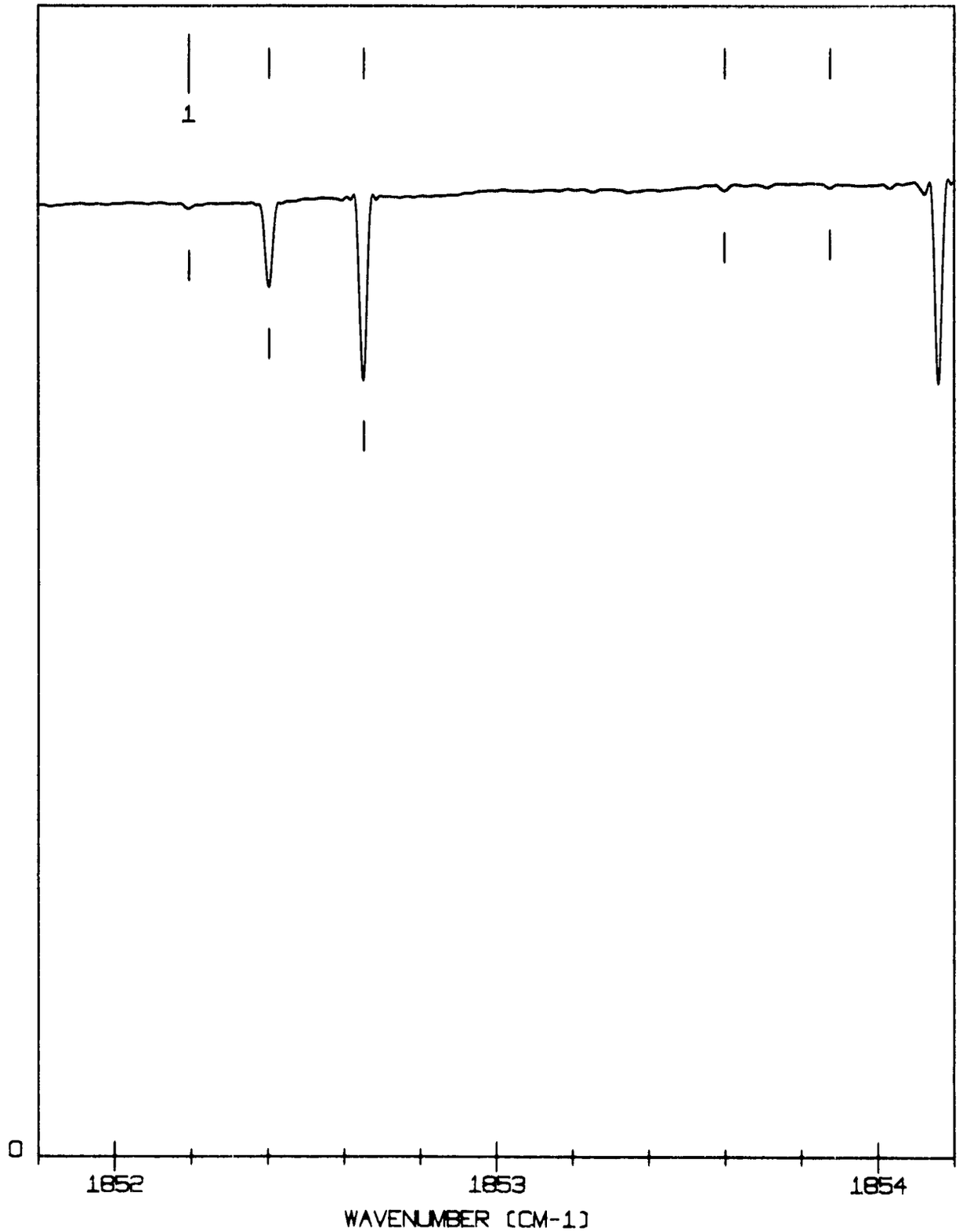


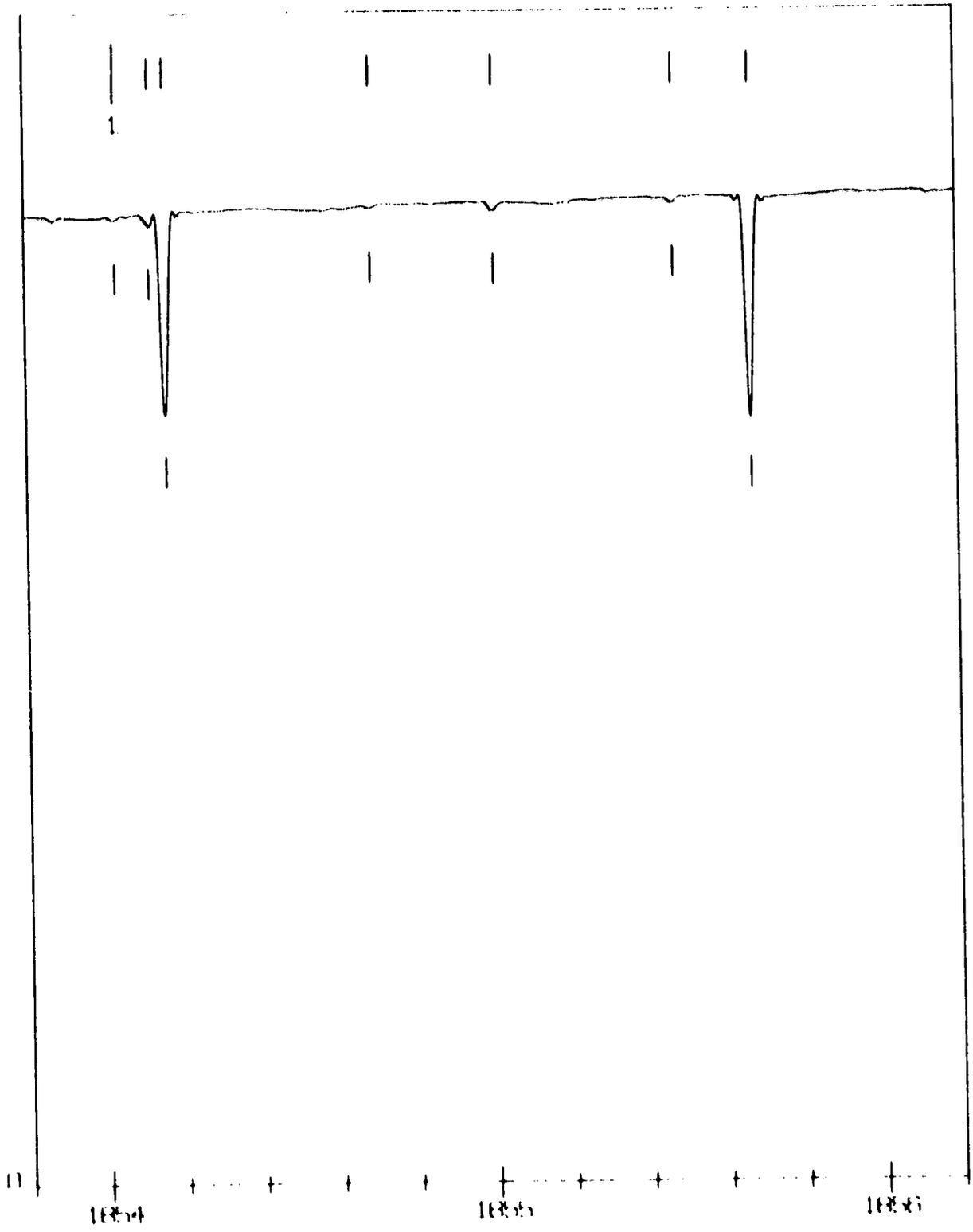
TABLE A13

Line Positions and Identifications (1854-1856 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1854.03252	1854.03135	21103-10002 626	P56
2	1854.12135		H2O SIDELOBE	
3	1854.16067	1854.16074	20003-01101 626	P30
4	1854.69229		?	
5	1855.01033	1855.00910	11102-00001 636	P56
6	1855.47375	1855.47299	21103-10002 626	P54
7	1855.67015	1855.67011	20003-01101 626	P33

FRAME A13

0.397 Torr 53 meters



WAVENUMBER (CM-1)

TABLE A14

Line Positions and Identifications (1856-1858 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1856.25952		H2O	
2	1856.42225	1856.42283	11102-00001 636	P54
3	1856.91797	1856.91881	21103-10002 626	P52
4	1857.18144	1857.18141	20003-01101 626	P31
5	1857.57643	1857.57646	12202-01101 636	P34
6	1857.62341		H2O	
7	1857.84088	1857.84086	11102-00001 636	P52

FRAME A14

9.857 Torr 384 meters

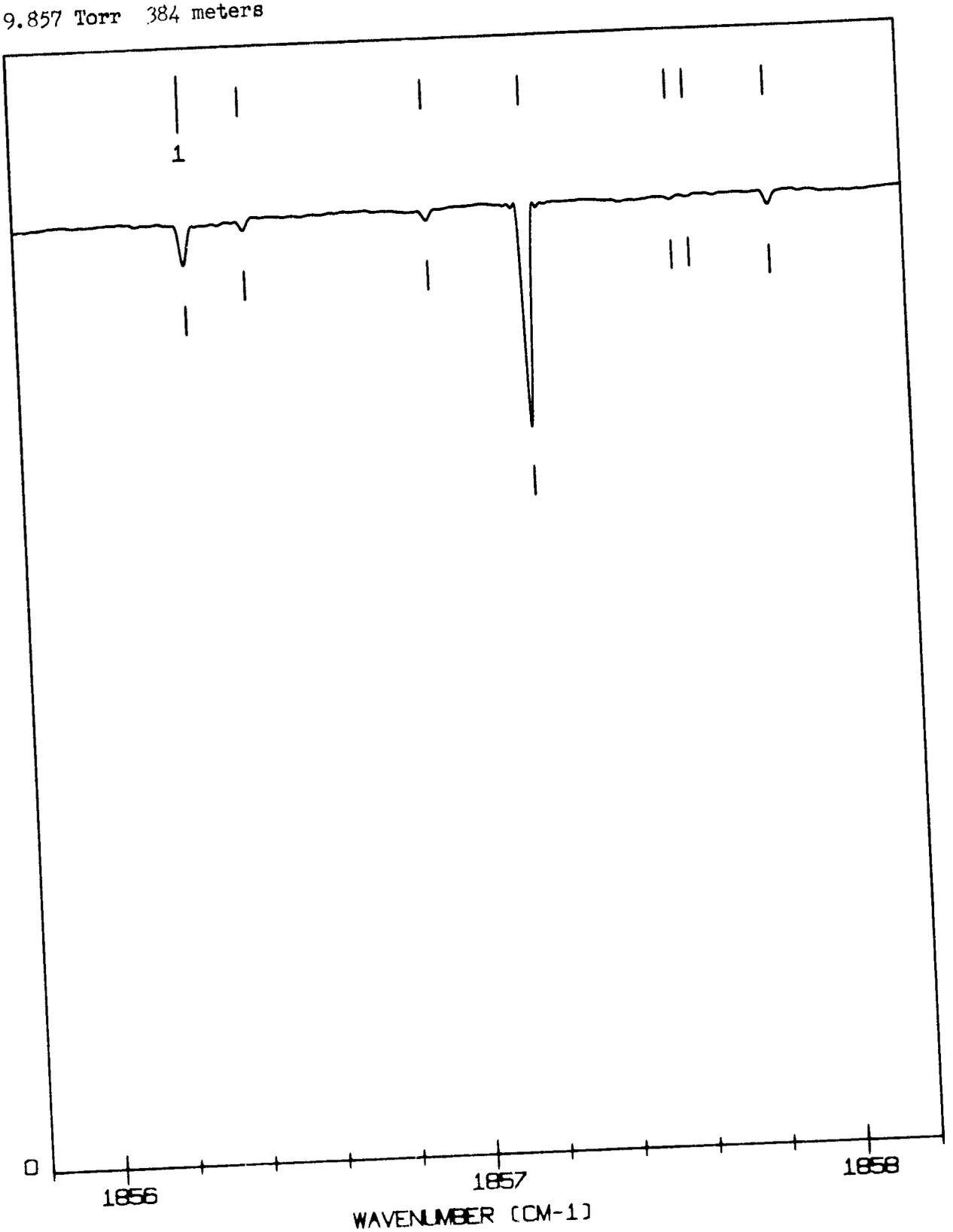


TABLE A15

Line Positions and Identifications (1858-1860 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1858.27222		H2O	
2	1858.36831	1858.36885	21103-10002 626	P50
			H2O	
3	1858.48146		H2O	
4	1858.51905		H2O	
5	1858.69477	1858.69487	20003-01101 626	P29
6	1859.03874	1859.02355	12202-01101 636	P32
		1859.04371	12202-01101 636	P33
7	1859.26273	1859.26332	11102-00001 636	P50
8	1859.38469	1859.38421	11102-00001 628	P59
9	1859.44889		?	
10	1859.70319		H2O	
11	1859.82364	1859.92315	21103-10002 626	P48
			SIDELOBE	
12	1859.86517		H2O	

FRAME A15

9.857 Torr 33¼ meters

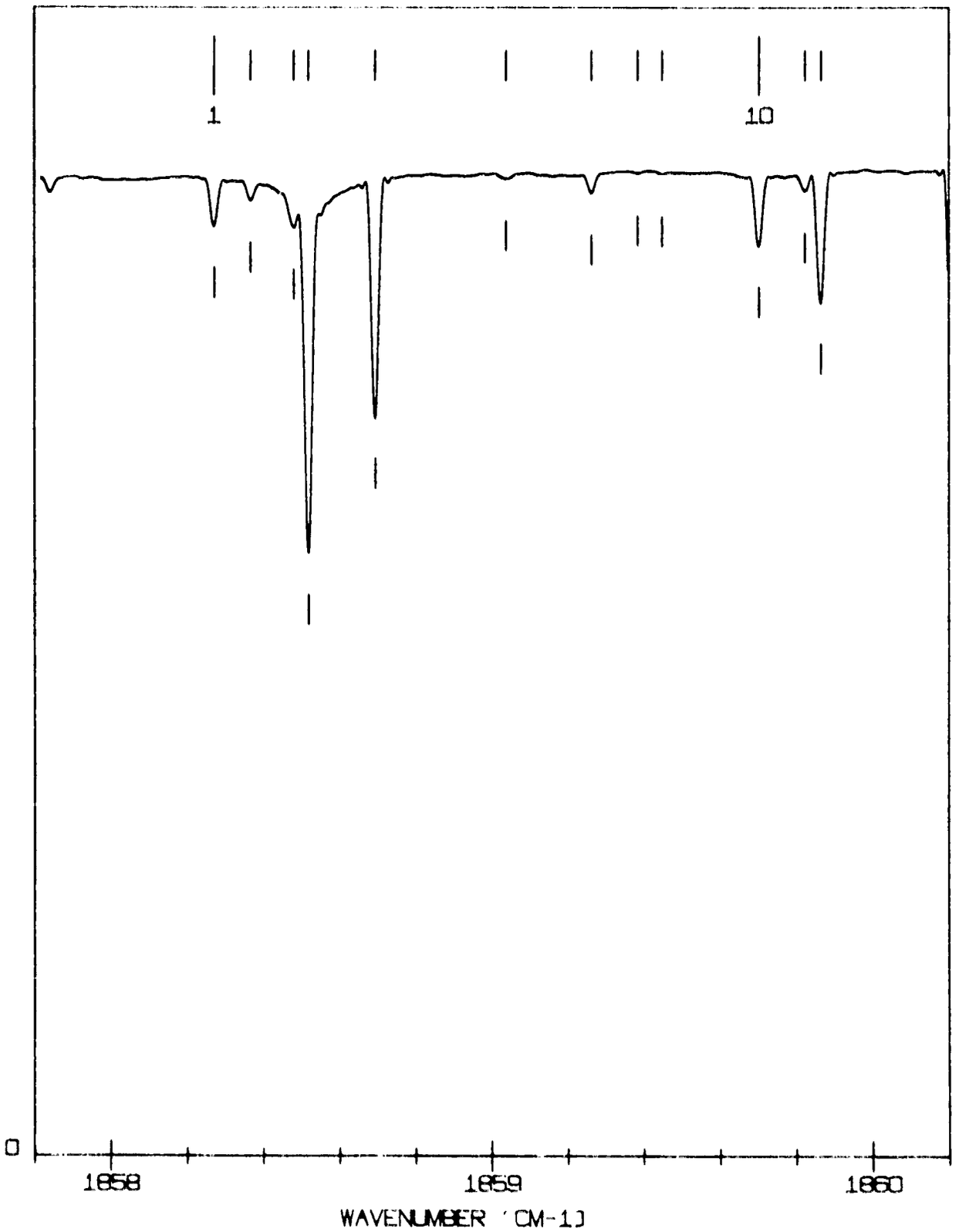


TABLE A16

Line Positions and Identifications (1860-1862 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1860.21068	1860.21070	20003-01101 626	P27
2	1860.41050	1860.41053	12202-01101 636	P31
3	1860.48574	1860.47999	12202-01101 636	P30
4	1860.69099	1860.69035	11102-00001 636	P48
5	1860.79113	1860.78999	11102-00001 628	P57
6	1860.91590		H2O	
7	1861.28214	1861.28173	21103-10002 626	P46
8	1861.53132		H2O	
9	1861.72915	1861.72912	20003-01101 626	P25
10	1861.79152	1861.79011	12202-01101 636	P29
11	1861.90487		H2O	
12	1861.94275	1861.94580	12202-01101 636	P28

FRAME A16

9.857 Torr 384 meters

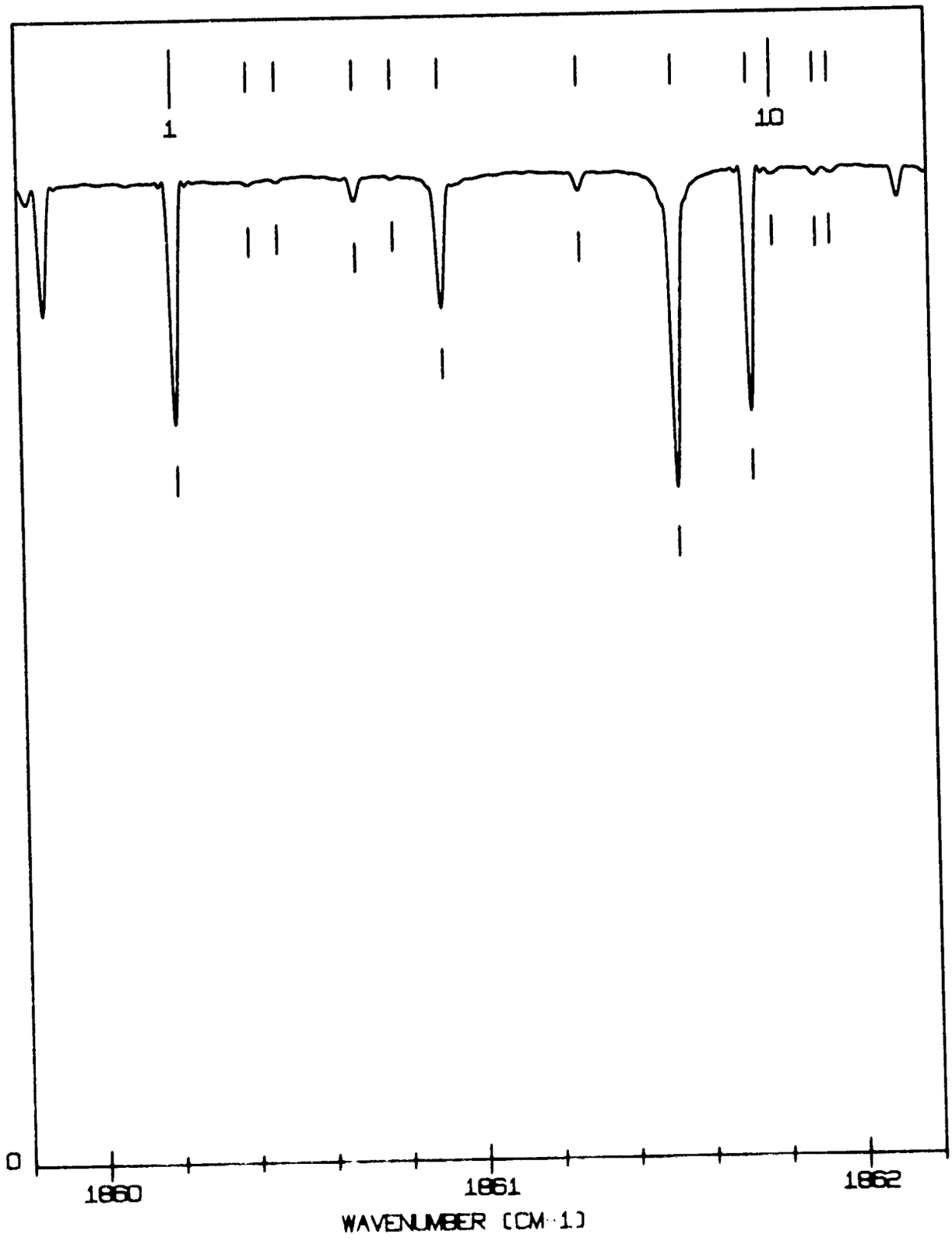


TABLE A17

Line Positions and Identifications (1862-1864 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1862.12157	1862.12206	11102-00001	636	P46
2	1862.19547		H2O		
3	1862.46855	1862.46801	21103-02201	626	R20
4	1862.74454	1862.74464	21103-10002	626	P44
5	1862.78303		H2O		
6	1862.90005	1862.90120	11102-00001	628	P54
7	1862.95618		H2O		
8	1863.18310	1863.18246	12202-01101	636	P27
9	1863.25034	1863.25033	20003-01101	626	P23
10	1863.42536	1863.42096	12202-01101	636	P26
11	1863.55836	1863.55859	11102-00001	636	P44
12	1863.60511	1863.60567	11102-00001	628	P53
13	1863.89104	1863.89602	21103-02201	626	R21
14	1863.97722	1863.97851	21103-02201	626	R22

FRAME A17

9.857 Torr 384 meters

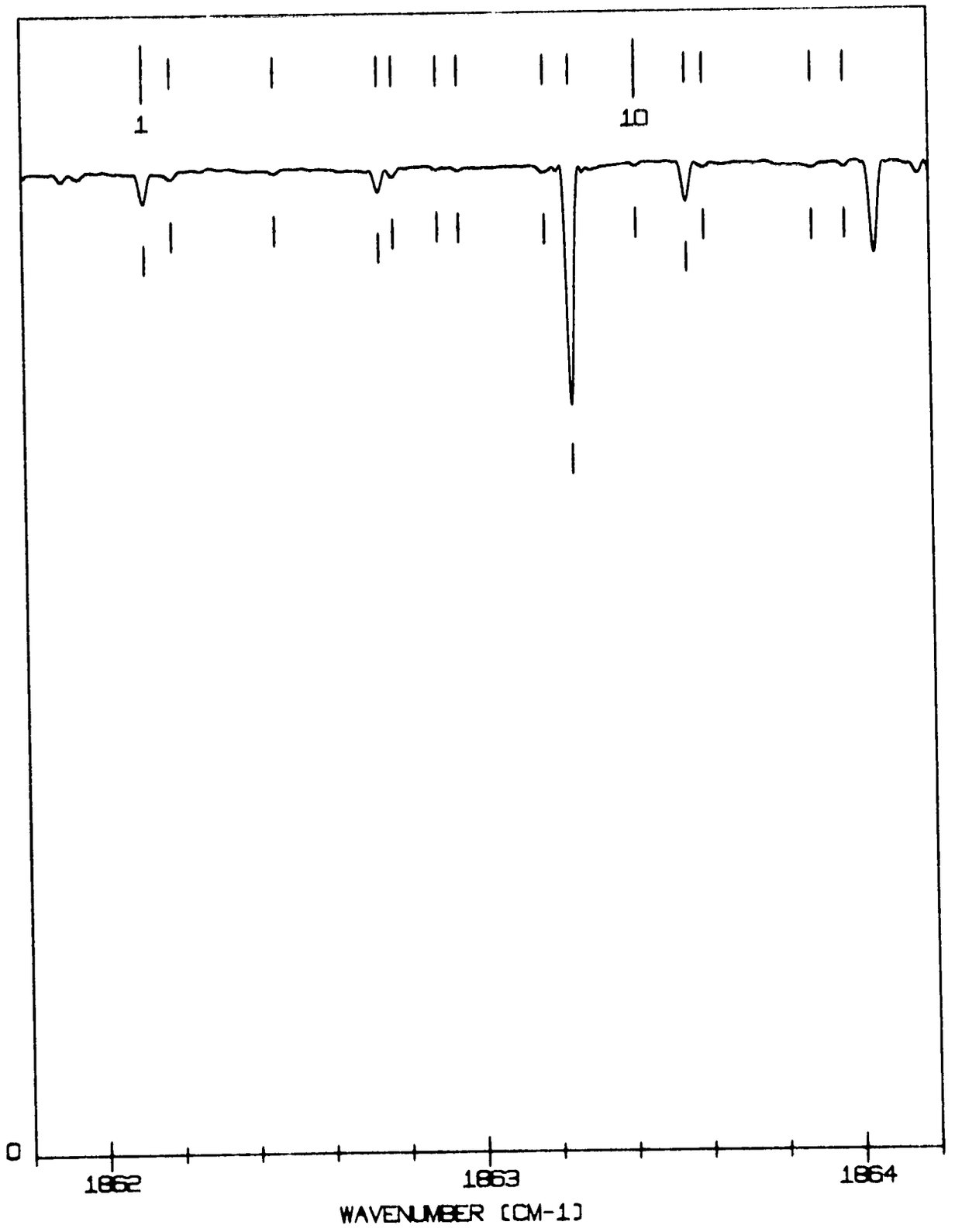


TABLE A18

Line Positions and Identifications (1864-1866 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1864.05509		H2O		
2	1864.17131		H2O		
3	1864.21190	1864.21191	21103-10002	626	P42
4	1864.32852		H2O		
		1864.31054	11102-00001	628	P52
5	1864.58674	1864.58759	12202-01101	636	P25
6	1864.77447	1864.77448	20003-01101	626	P21
7	1864.90428	1864.90547	12202-01101	636	P24
8	1865.00055	1865.00002	11102-00001	636	P42
		1865.01581	11102-00001	628	P51
9	1865.48037	1865.47920	21103-02201	626	R24
10	1865.52253	1865.52180	21103-02201	626	R23
11	1865.68348	1865.68356	21103-10002	626	P40
12	1865.72088	1865.72150	11102-00001	628	P50

FRAME A18

9.897 Torr 85 meters

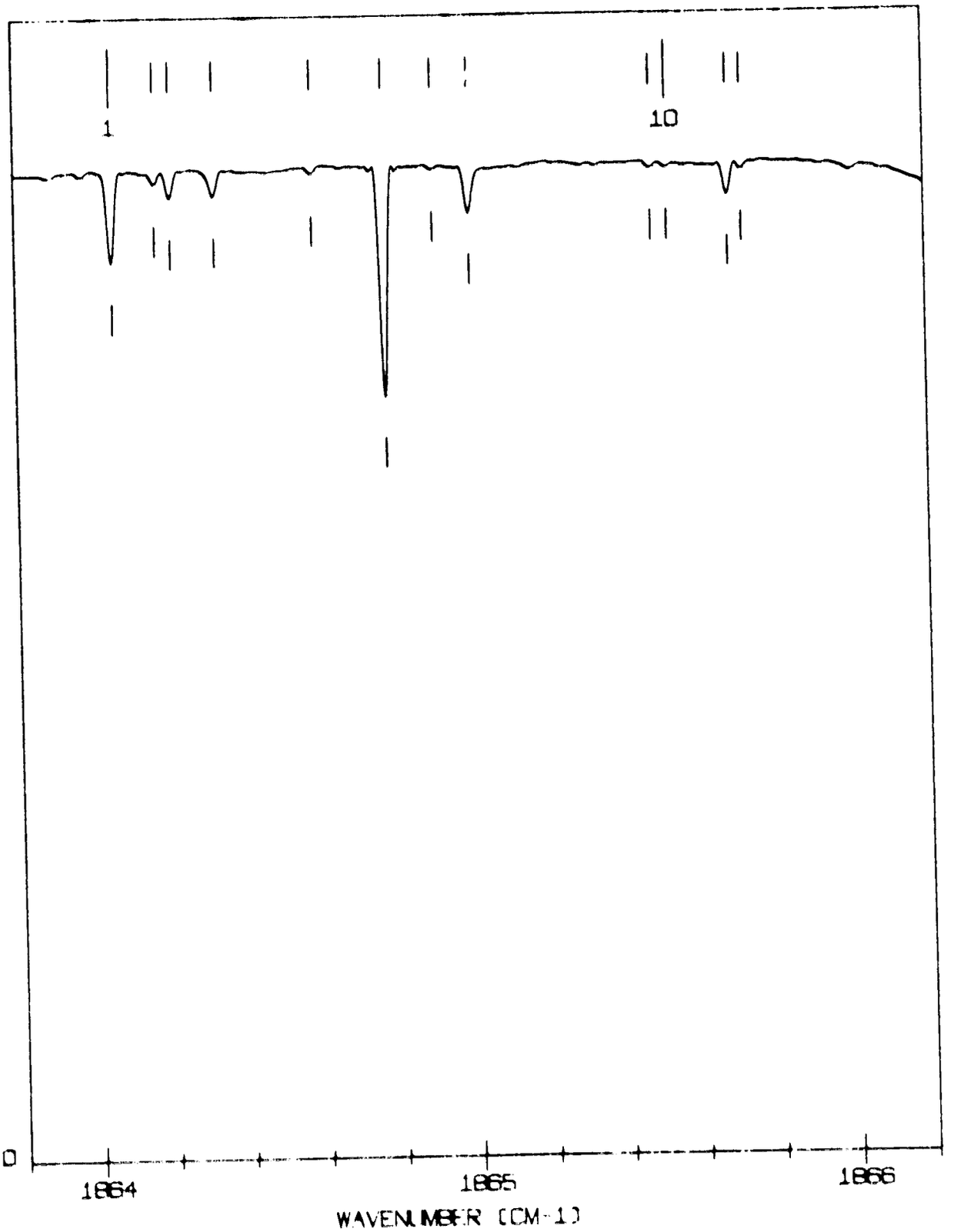


TABLE A19

Line Positions and Identifications (1866-1868 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1866.00719	1866.00548	12202-01101 636	P23
2	1866.09076		H2O?	
3	1866.30272	1866.30176	20003-01101 626	P19
			H2O	
4	1866.38094		H2O	
5	1866.44279	1866.44649	11102-00001 636	P40
		1866.42762	11102-00001 628	P49
6	1866.83806		?	
7	1866.97055	1866.97148	21103-02201 626	R26
8	1867.15911	1867.15961	21103-10002 626	P38
		1867.13419	11102-00001 628	P48
		1867.15108	21103-02201 626	R25
9	1867.38752	1867.39218	12202-01101 626	P68
10	1867.43298	1867.43615	12202-01101 636	P21
11	1867.85235		H2O	
		1867.83229	20003-01101 626	P17
		1867.89807	11102-00001 636	P38
		1867.84121	11102-00001 628	P47
12	1867.92278		H2O	

FRAME A19

9.857 Torr 384 meters

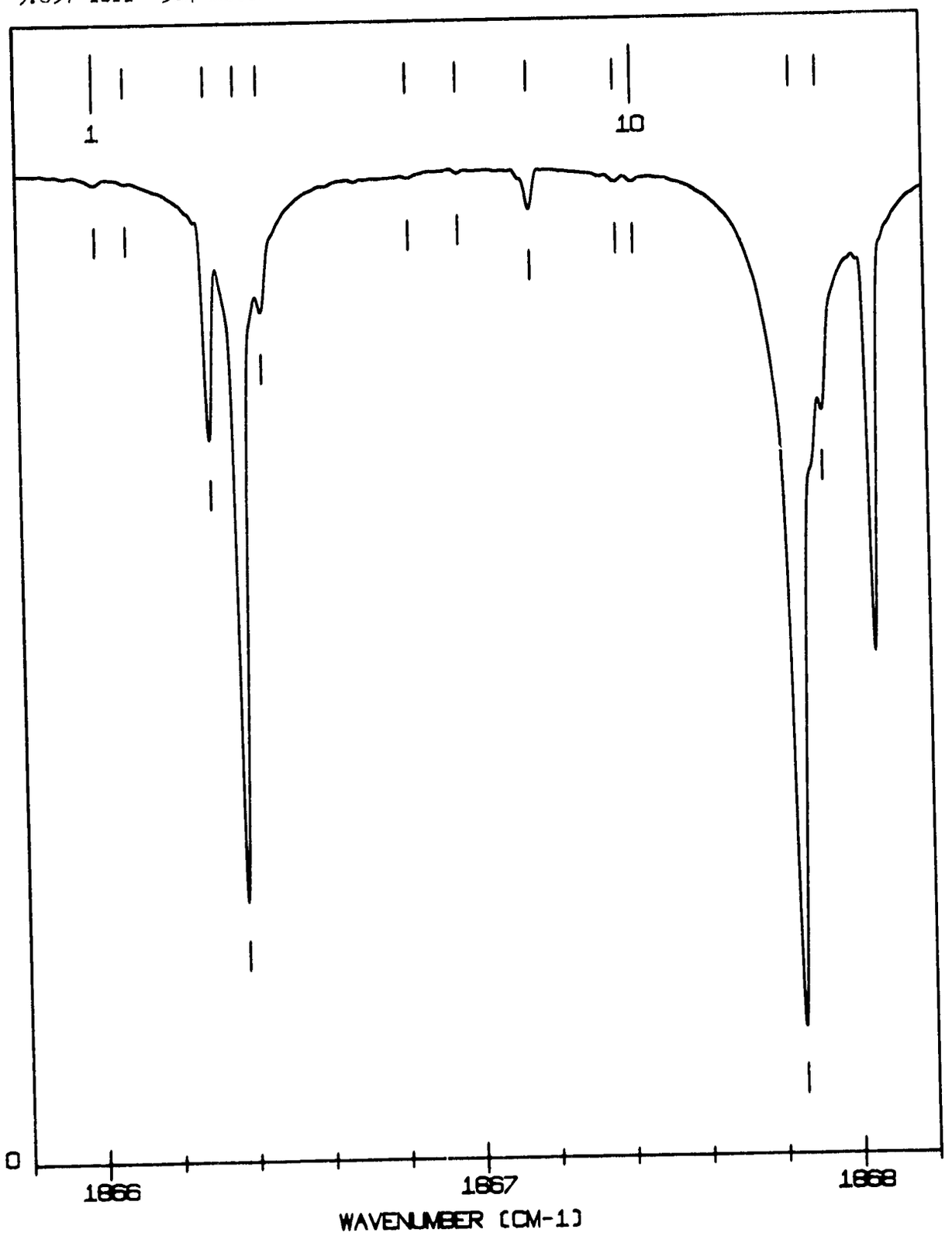


TABLE A20

Line Positions and Identifications (1868-1870 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1868.05380		H2O		
2	1868.45680	1868.45640	21103-02201	626	R28
3	1868.54877	1868.54869	11102-00001	628	P46
4	1868.64131	1868.64010	21103-10002	626	P36
5	1868.72675		H2O		
6	1868.78915	1868.79856	12202-01101	626	P66
		1868.78385	21103-02201	626	R27
7	1869.34526		H2O		
		1869.36621	20003-01101	626	P15
		1869.25666	11102-00001	628	P45
		1869.35486	11102-00001	636	P36
		1869.43827	13302-02201	626	P49
8	1869.85638	1869.85805	12202-01101	626	P69
9	1869.93456	1869.93468	21103-02201	626	R30
10	1869.96478	1869.96511	11102-00001	628	P44

FRAME A.30

0.852 Torr 85% meteran

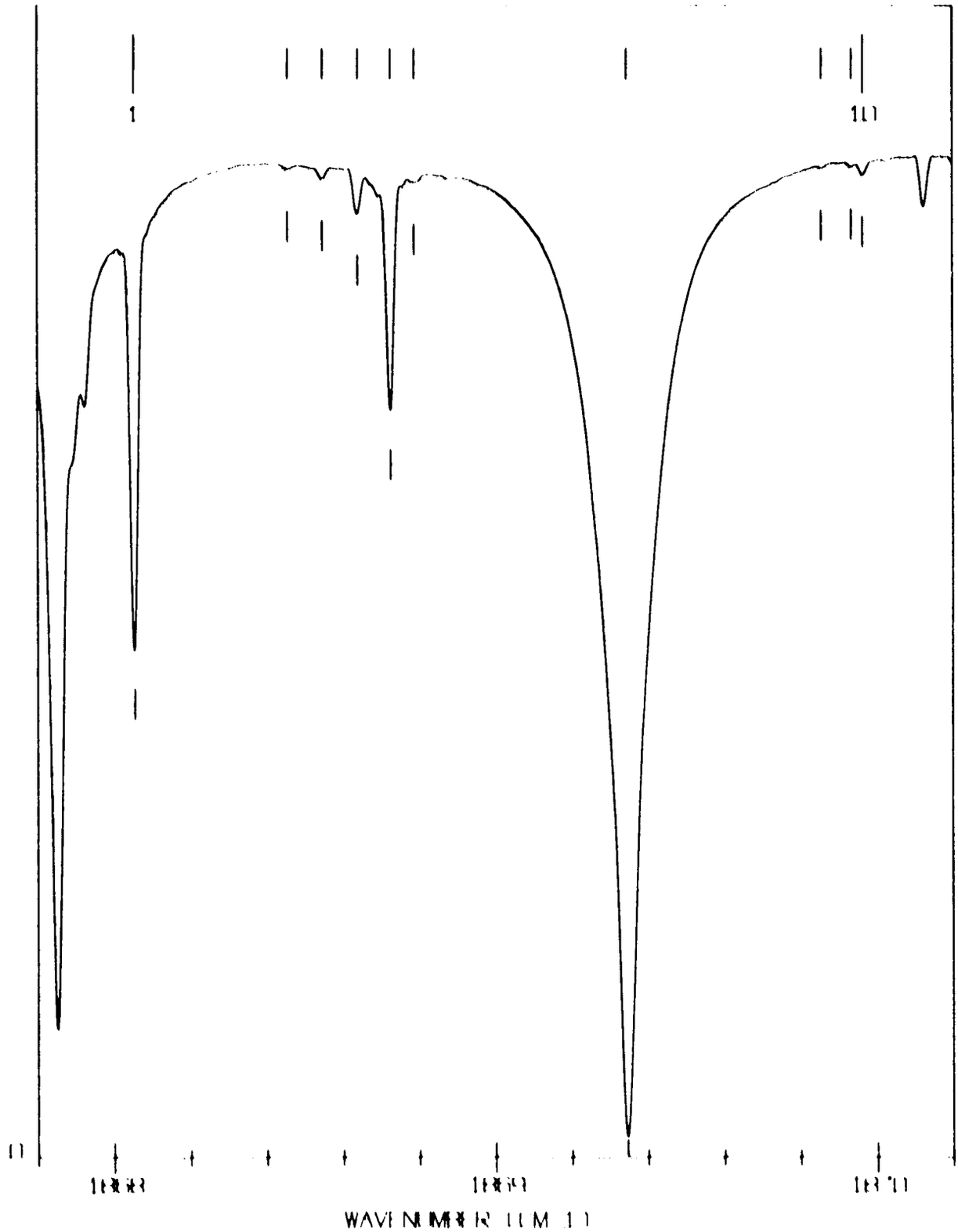


TABLE A21

Line Positions and Identifications (1870-1872 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1870.12531	1870.12504	21103-10002 626	P34
		1870.12710	13302-02201 626	P48
2	1870.20855	1870.20790	12202-01101 626	P64
3	1870.32986		?	
4	1870.41959	1870.42012	21103-02201 626	R29
5	1870.67529	1870.67407	11102-00001 628	P43
6	1870.80527		H2O	
		1870.81696	11102-00001 636	P34
		1870.81902	13302-02201 626	P47
7	1870.90304	1870.90362	20003-01101 626	P13
8	1871.07671	1871.07648	12202-01101 626	P67
9	1871.38357	1871.38353	11102-00001 628	P42
10	1871.51153	1871.51170	13302-02201 626	P46
11	1871.57937	1871.58068	11102-00001 626	P82
12	1871.61574	1871.61445	21103-10002 626	P32
		1871.62037	12202-01101 626	P62

FRAME A.1

0.867 Torr 884 meters

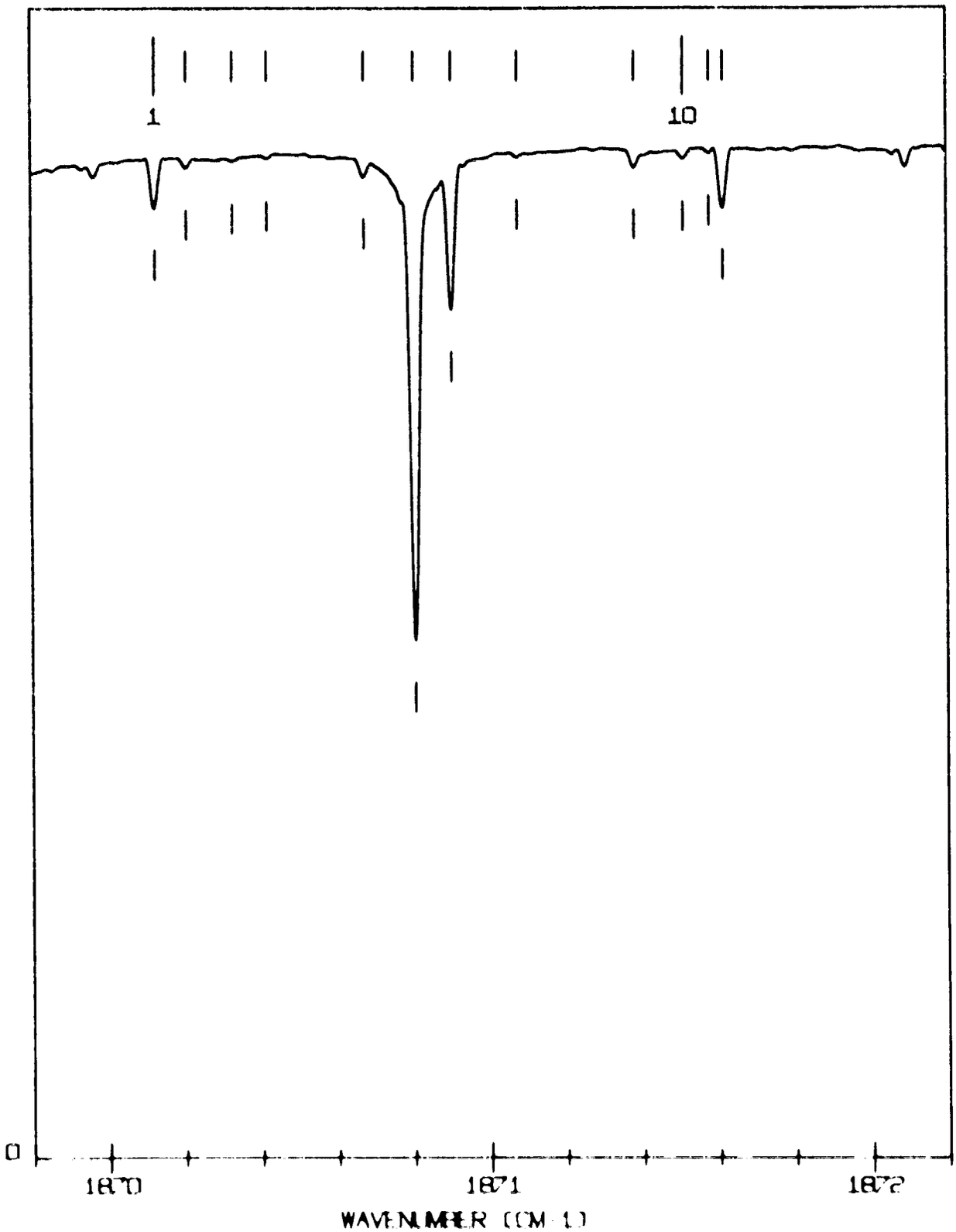


TABLE A22

Line Positions and Identifications (1872-1874 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1872.05953	1872.05989	21103-02201	626	R31
2	1872.09349	1872.09352	11102-00001	628	P41
3	1872.20707	1872.20713	13302-02201	626	P45
4	1872.28450	1872.28443	11102-00001	636	P32
5	1872.44459	1872.44462	20003-01101	626	P11
6	1872.80463	1872.80404	11102-00001	628	P40
7	1872.87286	1872.87248	21103-02201	626	R34
8	1872.90450	1872.90367	13302-02201	626	P44
9	1873.03515	1873.03615	12202-01101	626	P60
		1873.01435	11102-00001	626	P80
10	1873.10887	1873.10833	21103-10002	626	P30
11	1873.51508	1873.51510	11102-00001	628	P39
12	1873.54085	1873.53964	12202-01101	626	P63
13	1873.60313	1873.60266	13302-02201	626	P43
14	1873.70519	1873.70315	21103-02201	626	R33
			SIDELOBE		
15	1873.75738	1873.75736	11102-00001	636	P30
16	1873.98932	1873.98928	20003-01101	626	P9

FRAME A22

9.857 Torr 384 meters

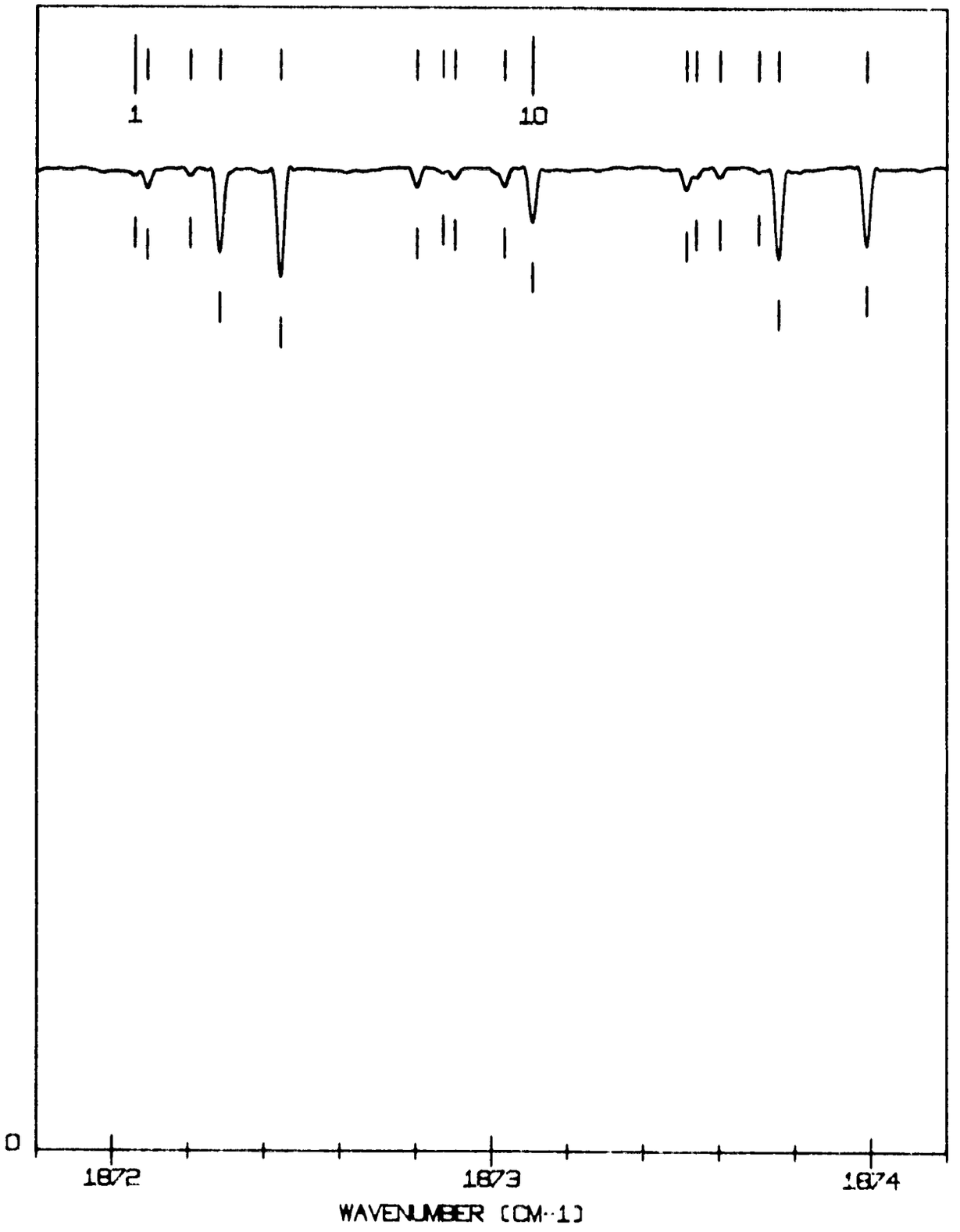


TABLE A23

Line Positions and Identifications (1874-1876 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1874.22640	1874.22671	11102-00001 628	P38
2	1874.30444	1874.30309	13302-02201 626	P42
3	1874.33103	1874.33173	21103-02201 626	R36
4	1874.45264	1874.45540	12202-01101 626	P58
		1874.44885	11102-00001 626	P78
5	1874.60669	1874.60671	21103-10002 626	P28
6	1874.78349	1874.78479	12202-01101 626	P61
7	1874.93870	1874.93888	11102-00001 628	P37
8	1875.00541	1875.00568	13302-02201 626	P41
9	1875.23596	1875.23582	11102-00001 636	P28
10	1875.35002	1875.34990	21103-02201 626	R35
11	1875.53759	1875.53767	20003-01101 626	P7
12	1875.65072	1875.65162	11102-00001 628	P36
13	1875.71028	1875.71002	13302-02201 626	P40
14	1875.78422	1875.78379	21103-02201 626	R38
15	1875.87976	1875.88434	11102-00001 626	P76
		1875.87828	12202-01101 626	P56

FRAME A23

9.867 Torr 884 meters

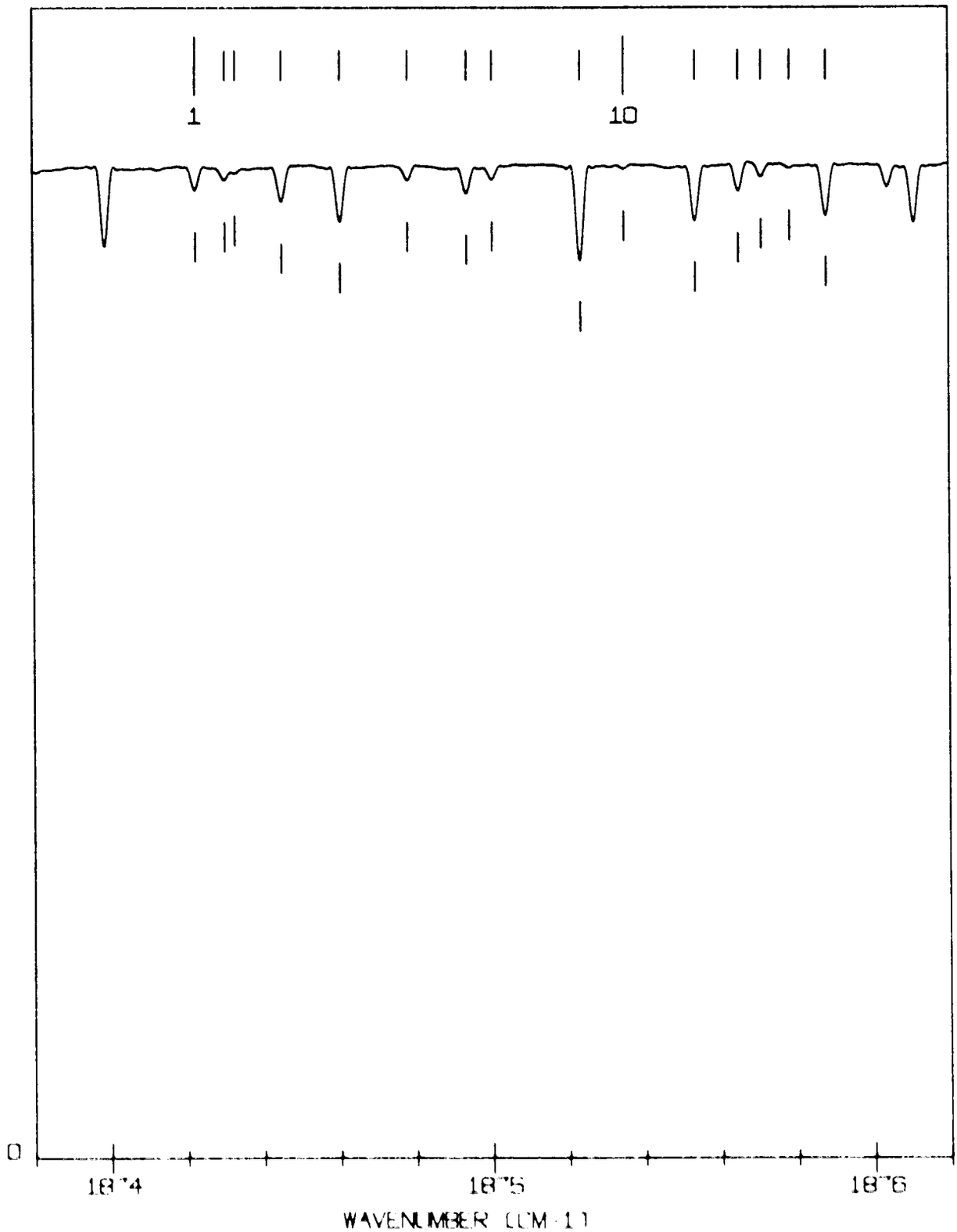


TABLE A24

Line Positions and Identifications (1876-1878 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1876.04028	1876.03924	12202-01101 626	P59
2	1876.10944	1876.10959	21103-10002 626	P26
3	1876.36504	1876.36493	11102-00001 628	P35
4	1876.41696	1876.41627	13302-02201 626	P39
5	1876.63169		H2O	
6	1876.71961	1876.71985	11102-00001 636	P26
7	1877.08434	1877.07883	11102-00001 628	P34
		1877.08982	20003-01101 626	P5
8	1877.12433	1877.12453	13302-02201 626	P38
9	1877.30703	1877.32100	11102-00001 626	P74
		1877.30316	12202-01101 626	P57
		1877.30495	12202-01101 626	P54
10	1877.61702	1877.61698	21103-10002 626	P24
11	1877.79123	1877.79332	11102-00001 628	P33
			H2O	
12	1877.83436	1877.83449	13302-02201 626	P37

FRAME A24

9.857 Torr 384 meters

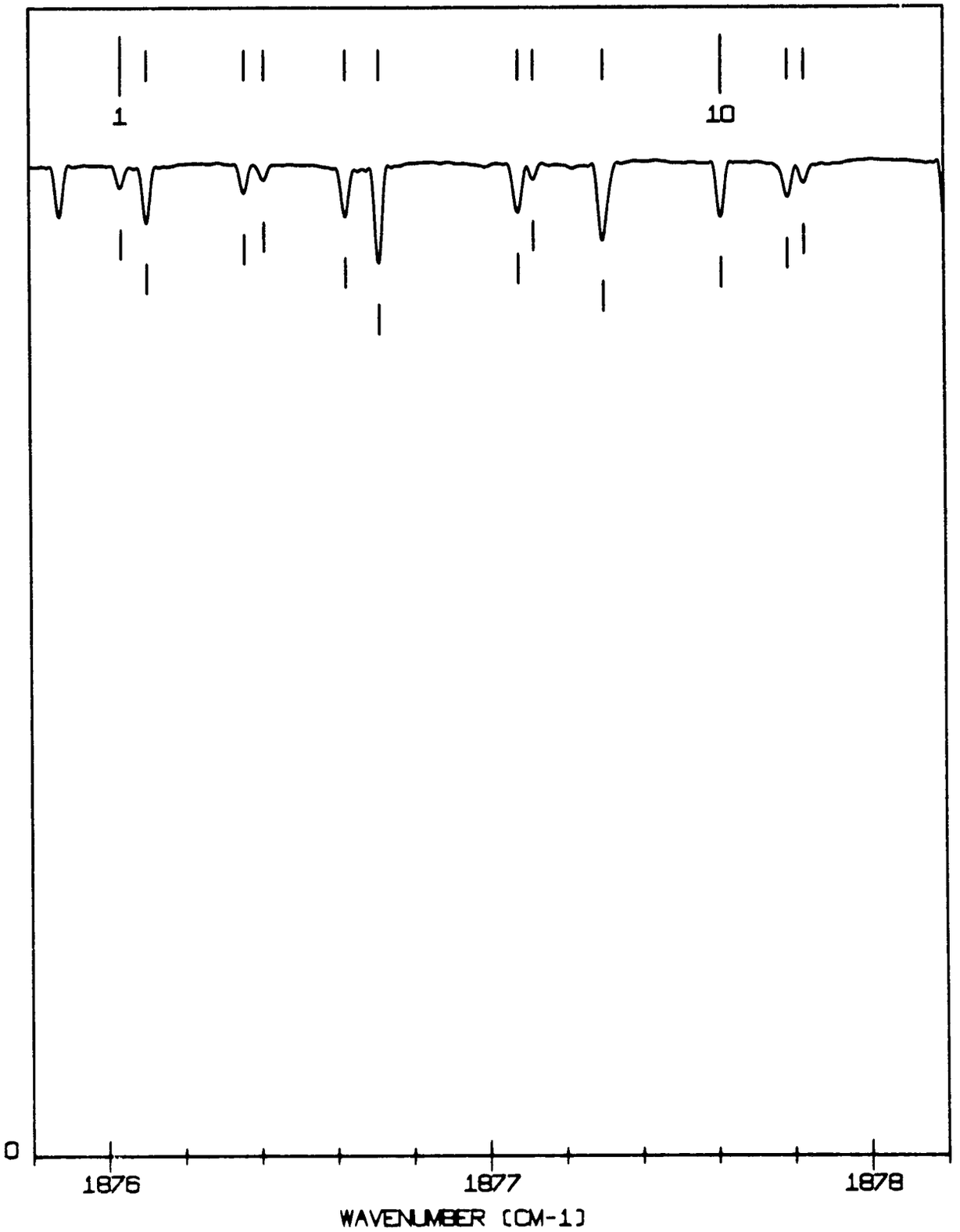


TABLE A25

Line Positions and Identifications (1878-1880 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1878.20963	1878.20953	11102-00001	636	P24
2	1878.50805	1878.50841	11102-00001	628	P32
3	1878.54532	1878.54666	13302-02201	626	P36
4	1878.57650	1878.57669	12202-01101	626	P55
5	1878.64825	1878.64575	20003-01101	626	P3
6	1878.73572	1878.73555	12202-01101	626	P52
7	1878.75835	1878.75899	11102-00001	626	P72
8	1879.01783		H2O		
9	1879.12870	1879.12888	21103-10002	626	P22
10	1879.22430	1879.22411	11102-00001	628	P31
11	1879.26330	1879.26038	13302-02201	626	P35
12	1879.29709		H2O		
13	1879.59831		H2O		
14	1879.70468	1879.70490	11102-00001	636	P22
15	1879.78456		H2O		
16	1879.85978	1879.85997	12202-01101	626	P53
17	1879.94020	1879.94042	11102-00001	628	P30
18	1879.97648	1879.97649	13302-02201	626	P34

FRAME A25

9.857 Torr 384 meters

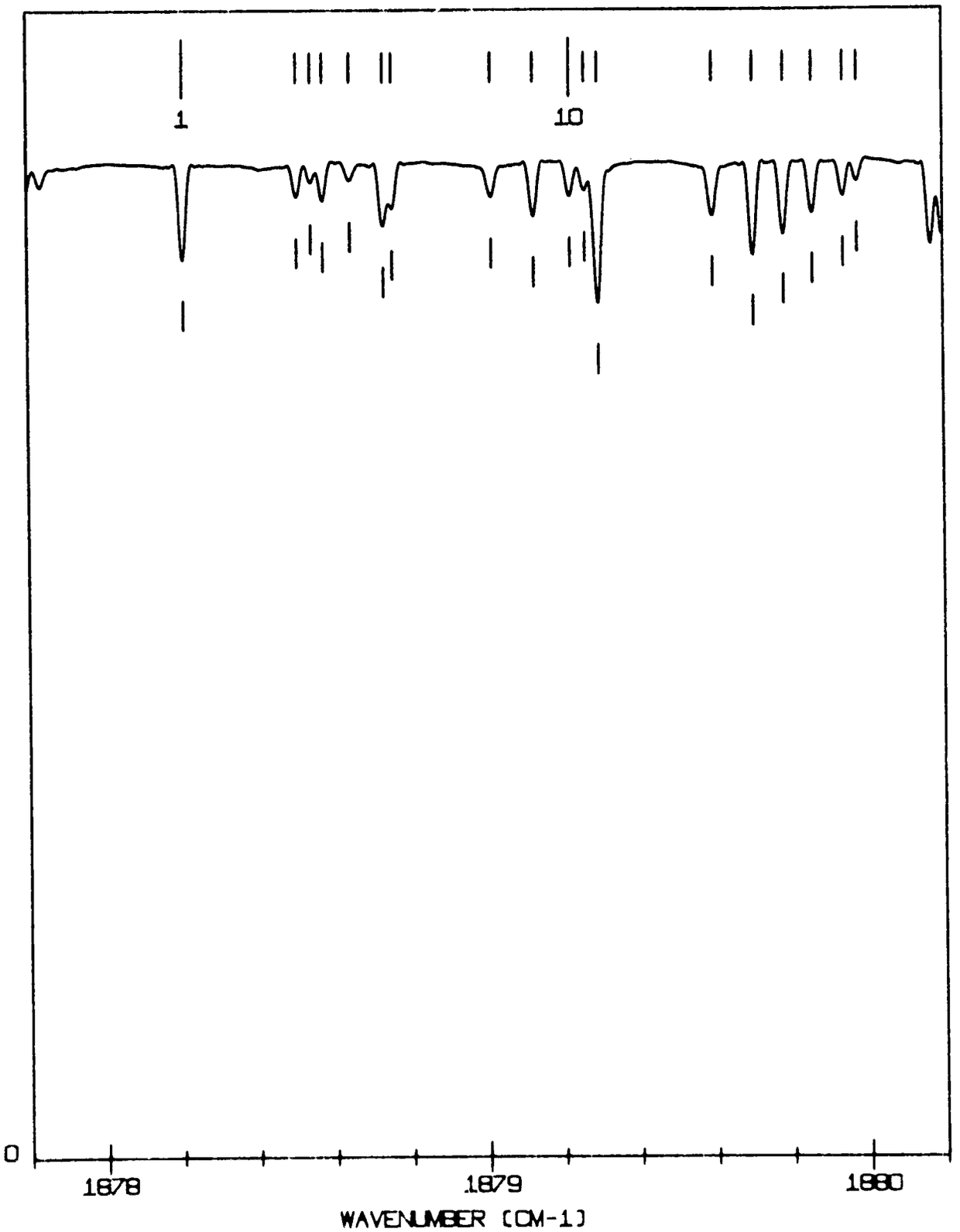


TABLE A26

Line Positions and Identifications (1880-1882 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1880.16982	1880.17023	12202-01101 626	P50
2	1880.19894	1880.19846	11102-00001 626	P70
		1880.20547	20003-01101 626	P1
3	1880.24744	1880.25063	20003-01101 626	Q52
4	1880.30330		?	
5	1880.32937	1880.32854	20003-01101 626	Q50
6	1880.40085	1880.39995	20003-01101 626	Q48
7	1880.46733	1880.46527	20003-01101 626	Q46
8	1880.52499	1880.52491	20003-01101 626	Q44
9	1880.57915	1880.57923	20003-01101 626	Q42
10	1880.64970	1880.64528	21103-10002 626	P20
		1880.65735	11102-00001 628	P29
		1880.62861	20003-01101 626	Q40
11	1880.69570	1880.69401	13302-02201 626	P33
		1880.71390	20003-01101 626	Q36
		1880.67339	20003-01101 626	Q38
12	1880.75049	1880.75045	20003-01101 626	Q34
13	1880.78321	1880.78333	20003-01101 626	Q32
14	1880.81281	1880.81283	20003-01101 626	Q30
15	1880.83919	1880.83920	20003-01101 626	Q28
16	1880.86748	1880.86270	20003-01101 626	Q26
17	1880.97250	1880.88356	20003-01101 626	Q24
		1880.90197	20003-01101 626	Q22
		1880.91815	20003-01101 626	Q20
		1880.93227	20003-01101 626	Q18
		1880.94449	20003-01101 626	Q16
		1880.95496	20003-01101 626	Q14
		1880.96381	20003-01101 626	Q12
		1880.97114	20003-01101 626	Q10
		1880.97706	20003-01101 626	Q8
		1880.98165	20003-01101 626	Q6
		1880.98497	20003-01101 626	Q4
		1880.98705	20003-01101 626	Q2
18	1881.15318	1881.15313	12202-01101 626	P51
19	1881.20601	1881.20600	11102-00001 626	P20
20	1881.37470	1881.37491	11102-00001 628	P28
21	1881.41339	1881.41405	13302-02201 626	P32
22	1881.60883	1881.60911	12202-01101 626	P48
23	1881.63967	1881.63958	11102-00001 626	P68

FRAME A26

9.857 Torr 384 meters

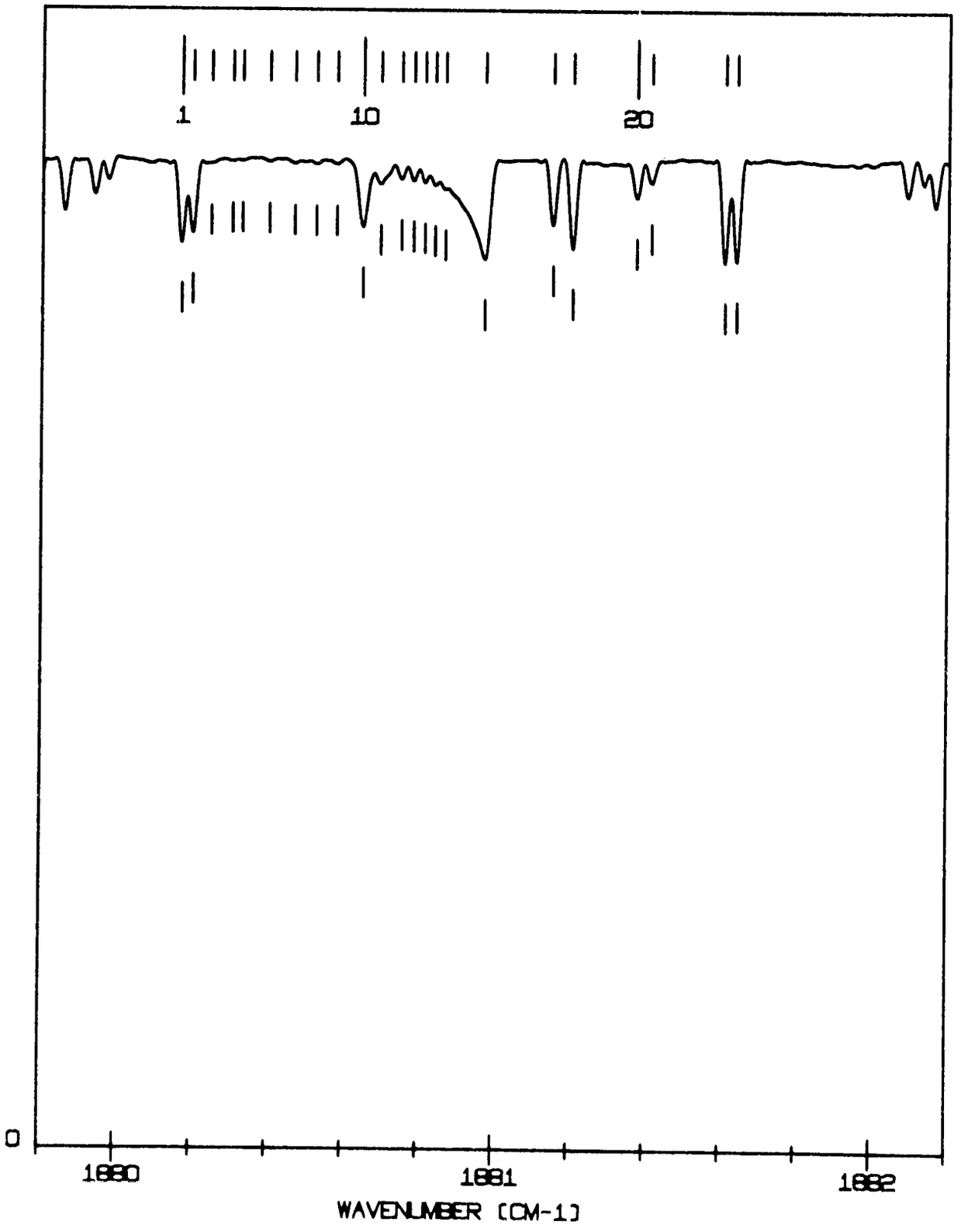


TABLE A27

Line Positions and Identifications (1882-1884 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1882.09320	1882.09310	11102-00001	628	P27
2	1882.13495	1882.13541	13302-02201	626	P31
3	1882.16613	1882.16620	21103-10002	626	P19
4	1882.45633	1882.45628	12202-01101	626	P49
5	1882.71307	1882.71287	11102-00001	636	P18
6	1882.81174	1882.81192	11102-00001	628	P26
7	1882.85950	1882.85939	13302-02201	626	P30
8	1883.05204	1883.05233	12202-01101	626	P46
9	1883.08246	1883.08251	11102-00001	626	P66
10	1883.53147	1883.53139	11102-00001	628	P25
11	1883.58496	1883.58464	13302-02201	626	P29
12	1883.69141	1883.69162	21103-10002	626	P16
13	1883.76951	1883.76951	12202-01101	626	P47

FRAME A27

9.857 Torr 384 meters

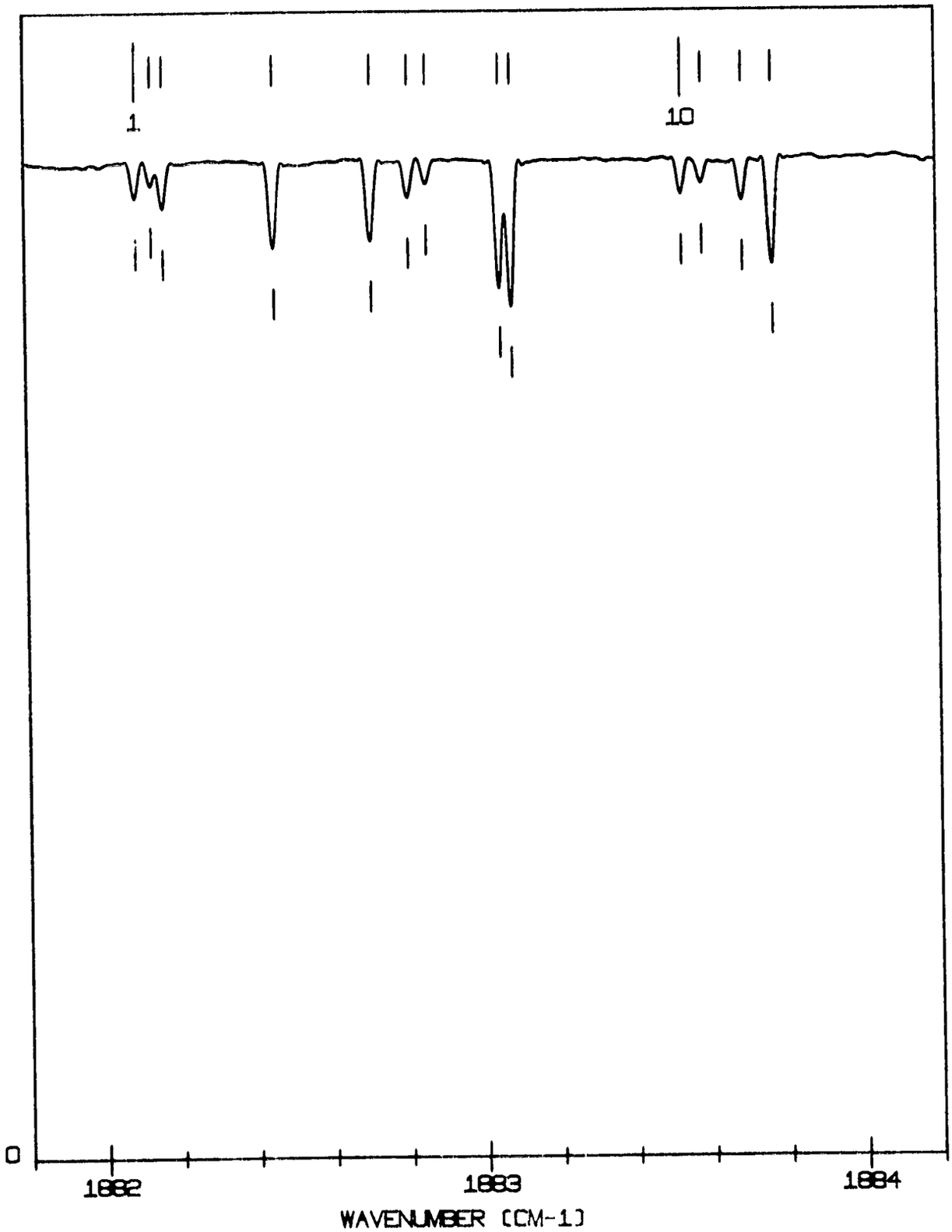


TABLE A28

Line Positions and Identifications (1884-1886 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1884.22569	1884.22554	11102-00001 636	P16
2	1884.25308	1884.25151	11102-00001 628	P24
3	1884.31301	1884.31255	13302-02201 626	P28
4	1884.39300		H2O	
5	1884.50012	1884.50000	12202-01101 626	P44
6	1884.52786	1884.52740	11102-00001 626	P64
7	1884.56506		H2O	
8	1884.97205	1884.97228	11102-00001 628	P23
9	1885.02181		H2O	
10	1885.04112	1885.04172	13302-02201 626	P27
11	1885.09291	1885.09292	12202-01101 626	P45
12	1885.22197	1885.22153	21103-10002 626	P14
13	1885.30126		H2O	
14	1885.61294	1885.61209	11102-00001 627	P42
15	1885.69372	1885.69371	11102-00001 628	P22
		1885.69399	20003-01101 626	R5
16	1885.74334	1885.74405	11102-00001 636	P14
17	1885.77045		H2O	
		1885.77357	13302-02201 626	P26
18	1885.97374	1885.97439	11102-00001 626	P62
		1885.95225	12202-01101 626	P42

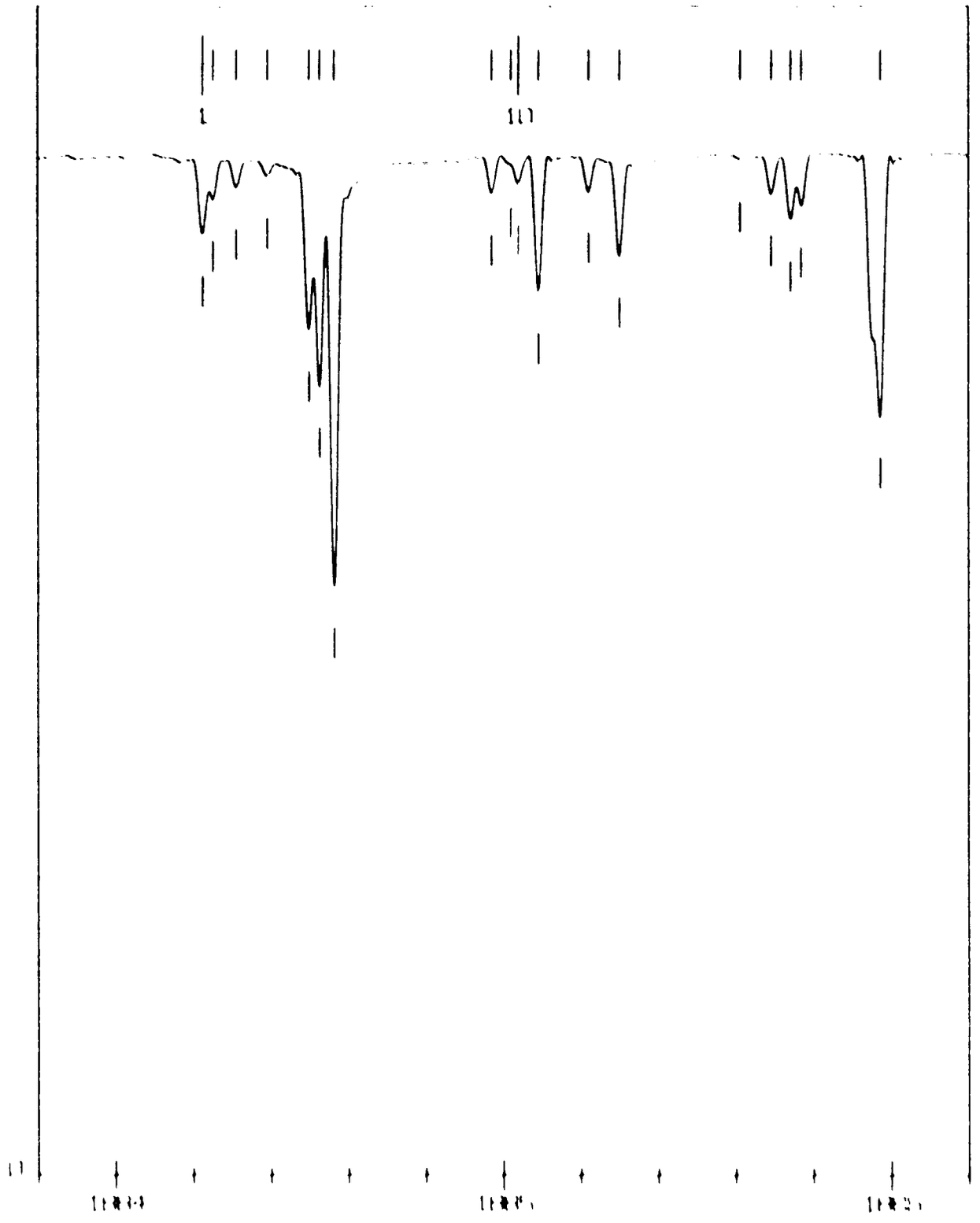


TABLE A29

Line Positions and Identifications (1886-1888 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1886.33476	1886.33552	11102-00001	627	P41
2	1886.42506	1886.42658	12202-01101	626	P43
		1886.41580	11102-00001	628	P21
3	1886.50723	1886.50670	13302-02201	626	P25
4	1886.75584	1886.75592	21103-10002	626	P12
5	1887.06180	1887.05989	11102-00001	627	P40
6	1887.13884	1887.13855	11102-00001	628	P20
7	1887.24072	1887.24249	13302-02201	626	P24
8	1887.26807	1887.26839	11102-00001	636	P12
		1887.27035	20003-01101	626	R7
9	1887.42080	1887.42362	11102-00001	626	P60
		1887.40918	12202-01101	626	P40
10	1887.77056	1887.77056	12202-01101	626	P41
		1887.78514	11102-00001	627	P39
11	1887.86171	1887.86197	11102-00001	628	P19
12	1887.98011	1887.97960	13302-02201	626	P23

9.857 Torr 384 meters

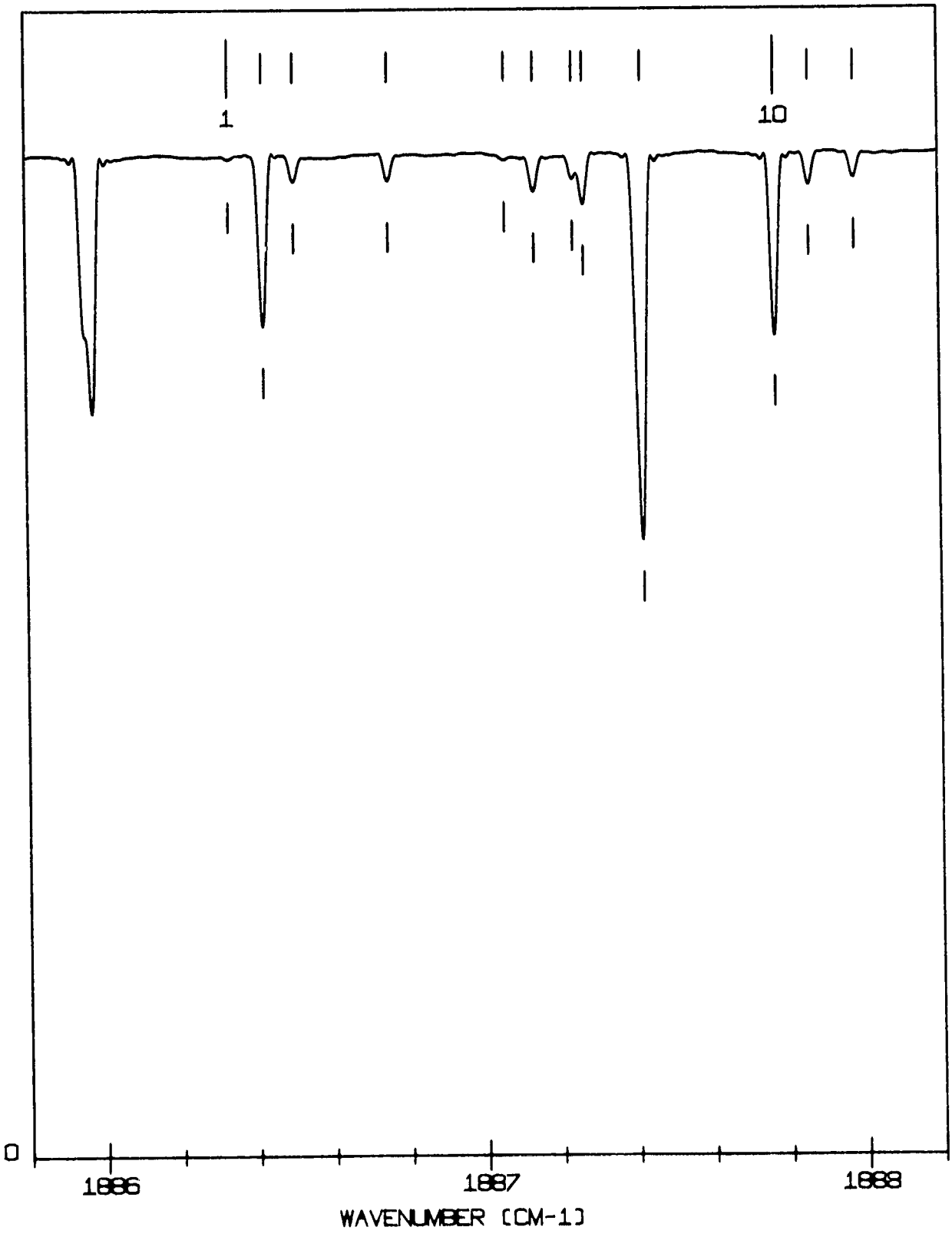


TABLE A30

Line Positions and Identifications (1888-1890 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1888.29455	1888.29478	21103-10002 626	P10
2	1888.47490		?	
3	1888.51306	1888.51124	11102-00001 627	P38
4	1888.58633	1888.58606	11102-00001 628	P18
5	1888.71913	1888.71932	13302-02201 626	P22
6	1888.79935	1888.79860	11102-00001 636	P10
			H2O	
7	1888.87388	1888.87525	11102-00001 626	P58
		1888.87090	12202-01101 626	P38
		1888.85021	20003-01101 626	R9
8	1889.12500	1889.12491	12202-01101 626	P39
9	1889.24263	1889.23817	11102-00001 627	P37
10	1889.31233	1889.31083	11102-00001 628	P17
11	1889.56912		H2O	
		1889.46046	13302-02201 626	P21
12	1889.83406	1889.83810	21103-10002 626	P8
13	1889.96573	1889.96588	11102-00001 627	P36

FRAME A30

9.867 Torr 384 meters

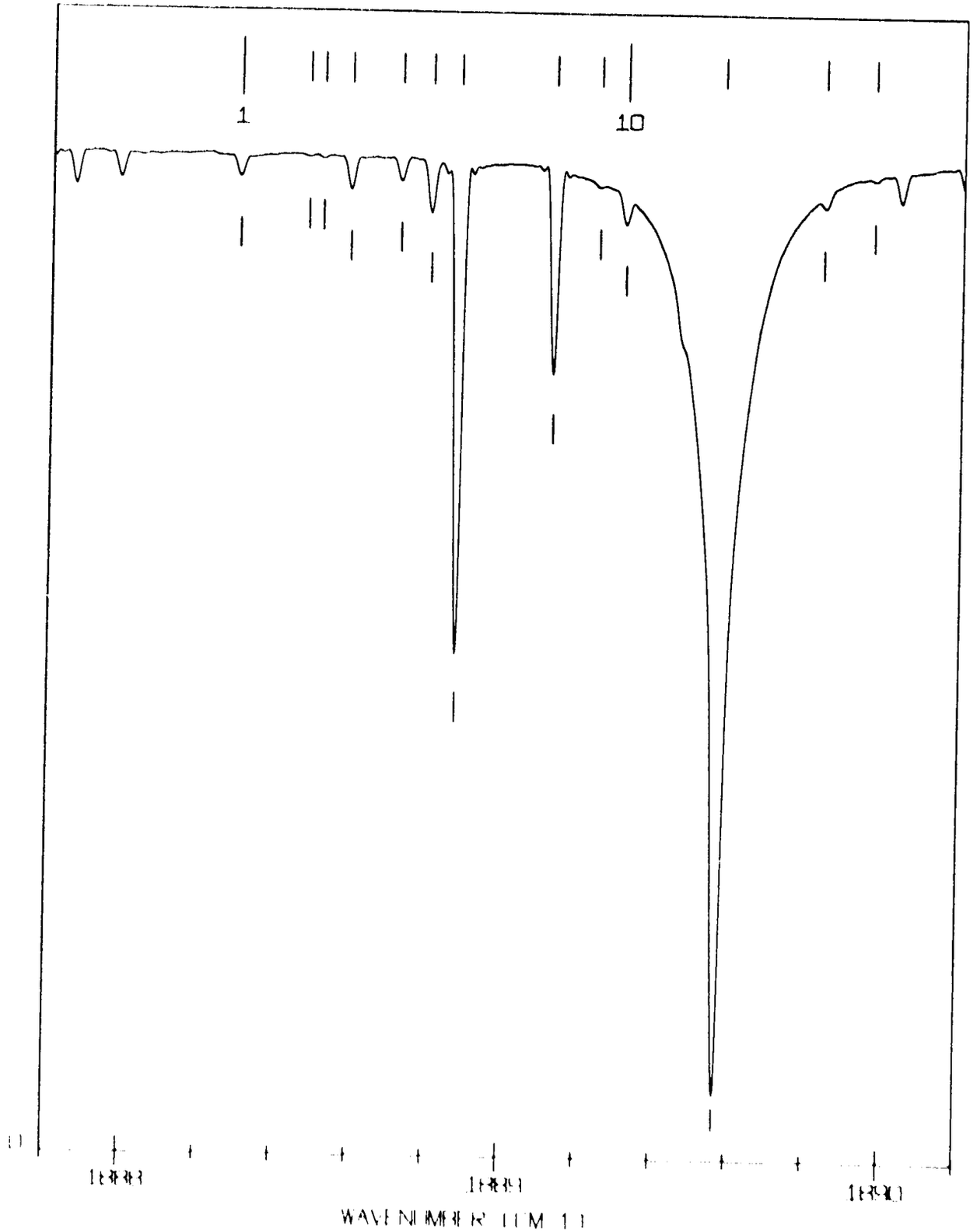


TABLE A31

Line Positions and Identifications (1890-1892 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1890.03603	1890.03627	11102-00001	628	P16
2	1890.20445	1890.20409	13302-02201	626	P20
			H2O		
3	1890.33192	1890.32940	11102-00001	626	P56
		1890.33749	12202-01101	626	P36
		1890.33467	11102-00001	636	P8
4	1890.43265	1890.43346	20003-01101	626	R11
5	1890.48965	1890.48970	12202-01101	626	P37
6	1890.69433	1890.69436	11102-00001	627	P35
7	1890.76266	1890.76240	11102-00001	628	P15
8	1890.94917	1890.94928	13302-02201	626	P19
9	1891.38537	1891.38585	21103-10002	626	P6
10	1891.42280	1891.42359	11102-00001	627	P34
11	1891.48990	1891.48920	11102-00001	628	P14
12	1891.55174		H2O		
13	1891.69712	1891.69683	13302-02201	626	P18
14	1891.78674	1891.78621	11102-00001	626	P54
		1891.80906	12202-01101	626	P34
15	1891.86521	1891.86495	12202-01101	626	P35
		1891.87661	11102-00001	636	P6

FRAME A31

9.857 Torr 384 meters

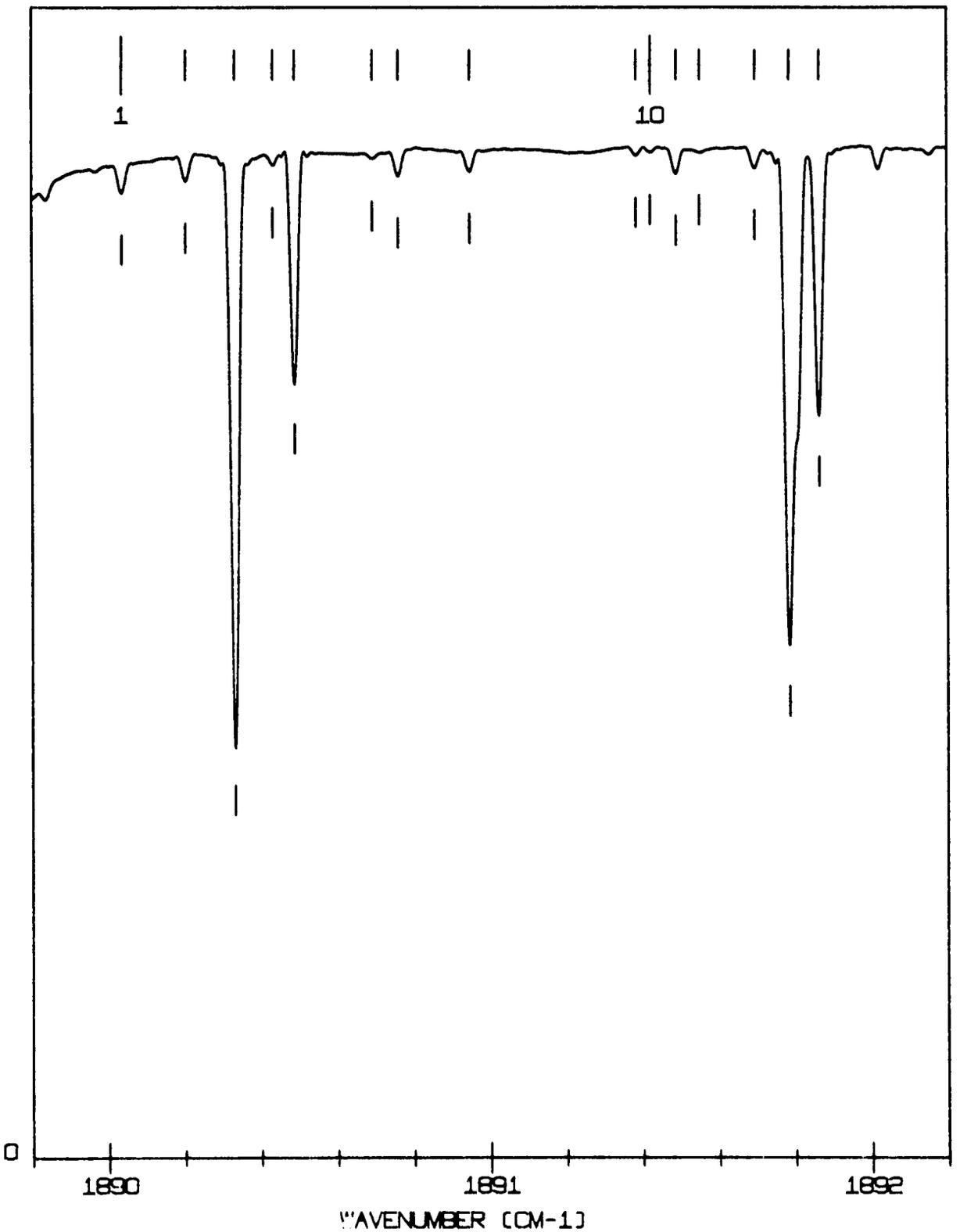


TABLE A32

Line Positions and Identifications (1892-1894 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1892.02031	1892.01998	20003-01101	626	R13
2	1892.15230	1892.15355	11102-00001	627	P33
3	1892.21710	1892.21668	11102-00001	628	P13
4	1892.44622	1892.44609	13302-02201	626	P17
5	1892.59748		H2O		
6	1892.88527	1892.88423	11102-00001	627	P32
7	1892.94428	1892.94485	11102-00001	628	P12
8	1893.19417	1893.19754	13302-02201	626	P16
			SIDELOBE		
9	1893.24695	1893.24581	11102-00001	626	P52
		1893.25072	12202-01101	626	P33
10	1893.28558	1893.28568	12202-01101	626	P32
11	1893.42404	1893.42441	11102-00001	636	P4
12	1893.61031	1893.60961	20003-01101	626	R15
		1893.61562	11102-00001	627	P31
13	1893.67530	1893.67371	11102-00001	628	P11
14	1893.71640		H2O		
15	1893.95077	1893.95090	13302-02201	626	P15

FRAME A32

9.857 Torr 384 meters

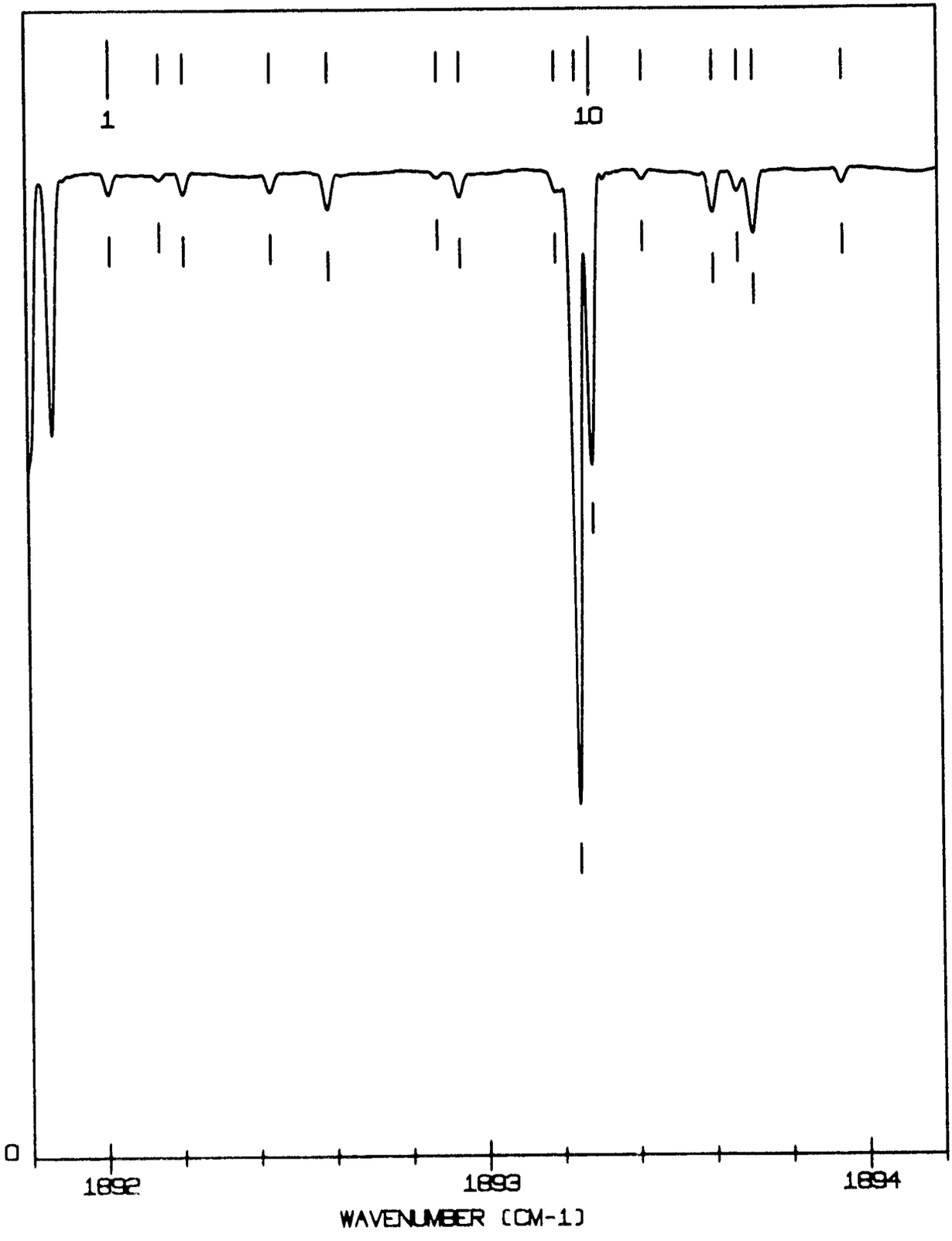


TABLE A33

Line Positions and Identifications (1894-1896 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1894.35129	1894.34773	11102-00001 627	P30
			H2O	
2	1894.40318	1894.40324	11102-00001 628	P10
3	1894.64771	1894.64702	12202-01101 626	P31
			H2O	
4	1894.68056		H2O	
5	1894.70807	1894.70831	11102-00001 626	P50
		1894.70624	13302-02201 626	P14
6	1894.76748	1894.76743	12202-01101 626	P30
7	1894.90734		H2O	
8	1895.19715		H2O	
		1895.20220	20003-01101 626	R17
		1895.13347	11102-00001 628	P9
		1895.08055	11102-00001 627	P29
9	1895.37420		H2O	
10	1895.46250	1895.46371	13302-02201 626	P13
11	1895.51364		H2O	
12	1895.73883		H2O	
13	1895.81301	1895.81410	11102-00001 627	P28
14	1895.86481	1895.86438	11102-00001 628	P8

FRAME A33

9.857 Torr 384 meters

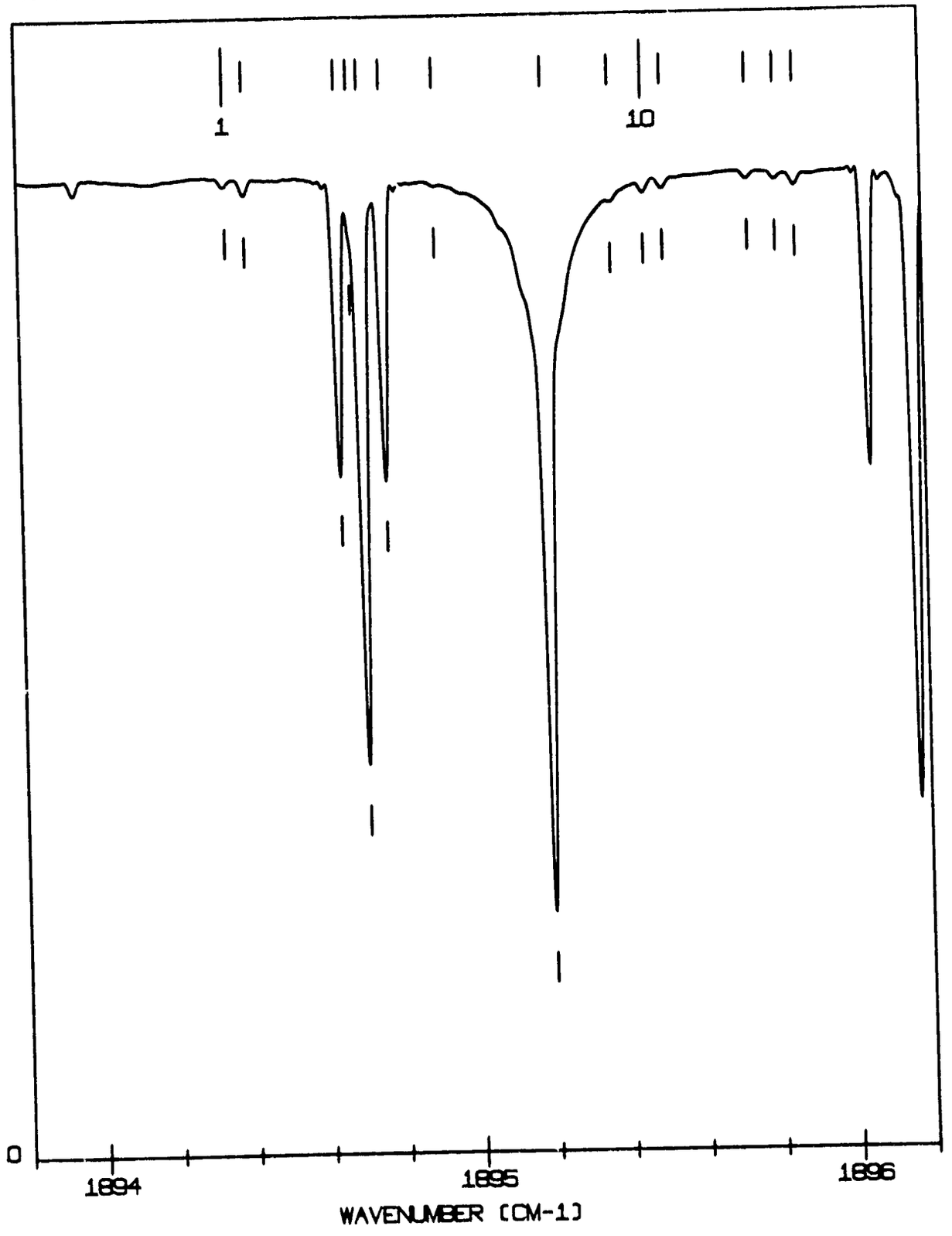


TABLE A34

Line Positions and Identifications (1896-1898 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1896.05392	1896.05388	12202-01101 626	P29
2	1896.17394	1896.17383	11102-00001 626	P48
		1896.19061	21103-10002 626	Q8
3	1896.25461	1896.25438	12202-01101 626	P28
		1896.22294	13302-02201 626	P12
		1896.26153	21103-10002 626	Q10
4	1896.34725	1896.34700	21103-10002 626	Q12
5	1896.44657	1896.44694	21103-10002 626	Q14
6	1896.56134	1896.56136	21103-10002 626	Q16
		1896.57316	11102-00001 636	Q4
		1896.54816	11102-00001 636	Q2
		1896.54838	11102-00001 627	P27
7	1896.60943	1896.61243	11102-00001 636	Q6
		1896.59597	11102-00001 628	P7
8	1896.66629	1896.66593	11102-00001 636	Q8
9	1896.69272	1896.69036	21103-10002 626	Q18
10	1896.73362	1896.73362	11102-00001 636	Q10
11	1896.80000	1896.79757	20003-01101 626	R19
		1896.81547	11102-00001 636	Q12
12	1896.91139	1896.91140	11102-00001 636	Q14
13	1896.99184	1896.98453	13302-02201 626	P11
		1896.99295	21103-10002 626	Q22
14	1897.02151	1897.02135	11102-00001 636	Q16
15	1897.14475	1897.14527	11102-00001 636	Q18
16	1897.16702	1897.16705	21103-10002 626	Q24
17	1897.28331	1897.28308	11102-00001 636	Q20
		1897.28340	11102-00001 627	P26
18	1897.32640	1897.32825	11102-00001 628	P6
19	1897.37039		H2O	
		1897.35653	21103-10002 626	Q26
20	1897.43489	1897.43469	11102-00001 636	Q22
21	1897.47134	1897.47131	12202-01101 626	P27
22	1897.52040		H2O	
23	1897.56136	1897.56117	21103-10002 626	Q28
24	1897.60489	1897.60004	11102-00001 636	Q24
			SIDELOBE	
25	1897.64251	1897.64250	11102-00001 626	P46
26	1897.74678	1897.74660	12202-01101 626	P26
		1897.74763	13302-02201 626	P10
27	1897.77918	1897.77902	11102-00001 636	Q26
		1897.78017	21103-10002 626	Q30
			SIDELOBE	
28	1897.85211		H2O	
29	1897.97172	1897.97155	11102-00001 636	Q28

FRAME A34

9.857 Torr 384 meters

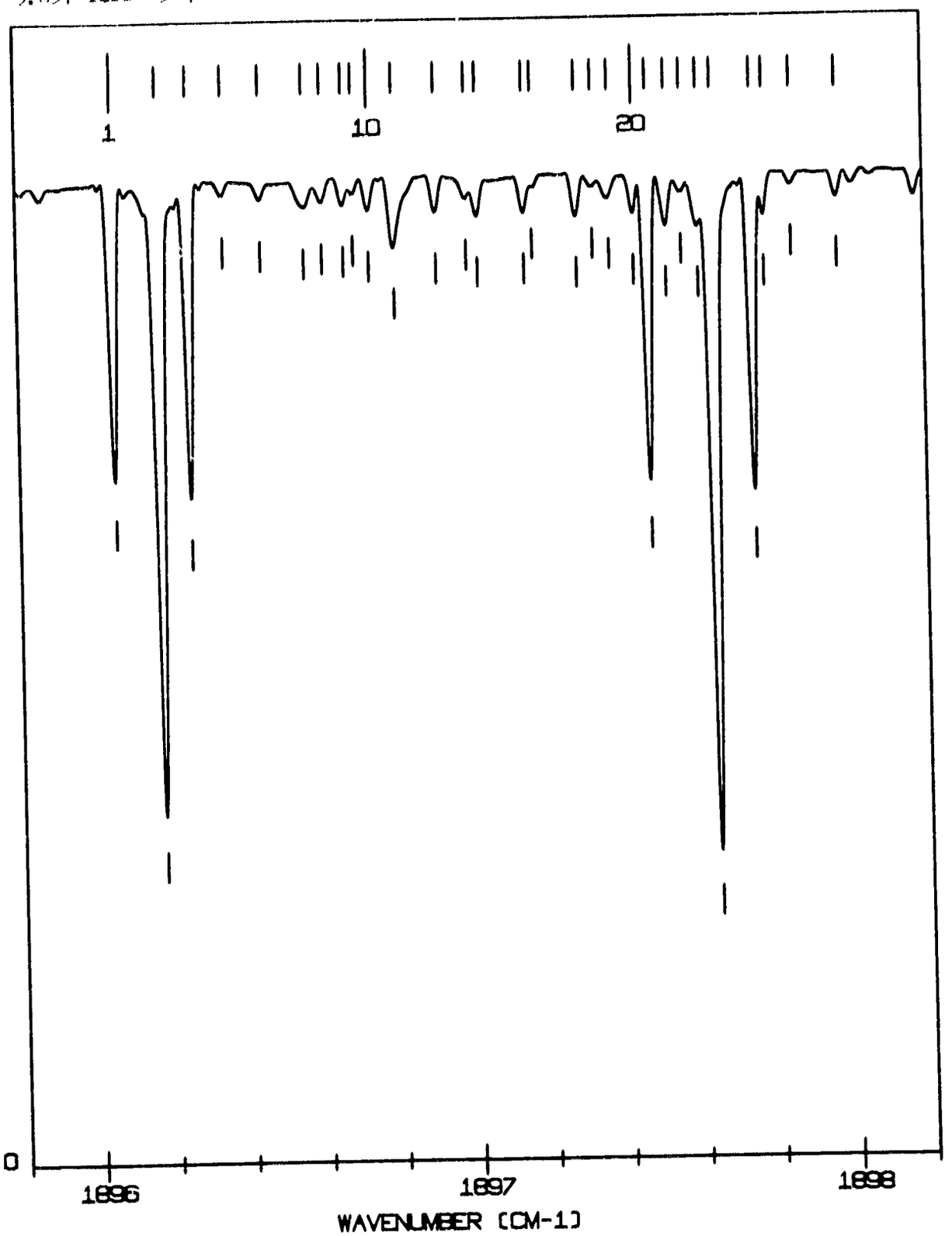


TABLE A35

Line Positions and Identifications (1898-1900 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1898.01311	1898.01175	21103-10002 626	Q32
		1898.01920	11102-00001 627	P25
2	1898.06223	1898.06121	11102-00001 628	P5
3	1898.17757	1898.17751	11102-00001 636	Q30
4	1898.25274	1898.25274	21103-10002 626	Q34
5	1898.39593	1898.39552	20003-01101 626	R21
		1898.39676	11102-00001 636	Q32
6	1898.51208	1898.51336	13302-02201 626	P9
		1898.49794	21103-10002 626	Q36
7	1898.62891	1898.62915	11102-00001 636	Q34
8	1898.66354		H2O	
9	1898.75669	1898.75578	11102-00001 627	P24
10	1898.79070	1898.79486	11102-00001 628	P4
11	1898.86962	1898.87447	11102-00001 636	Q36
			SIDELOBE	
12	1898.89914	1898.89933	12202-01101 626	P25
		1898.88764	11102-00001 636	R2
13	1899.11444	1899.11441	11102-00001 626	P44
		1899.13246	11102-00001 636	Q38
14	1899.24424	1899.24414	12202-01101 626	P24
15	1899.40287	1899.40281	11102-00001 636	Q40
16	1899.49240	1899.49319	11102-00001 627	P23
17	1899.68444	1899.68509	11102-00001 636	Q42
18	1899.99560	1899.99585	20003-01101 626	R23

FRAME A35

9.857 Torr 384 meters

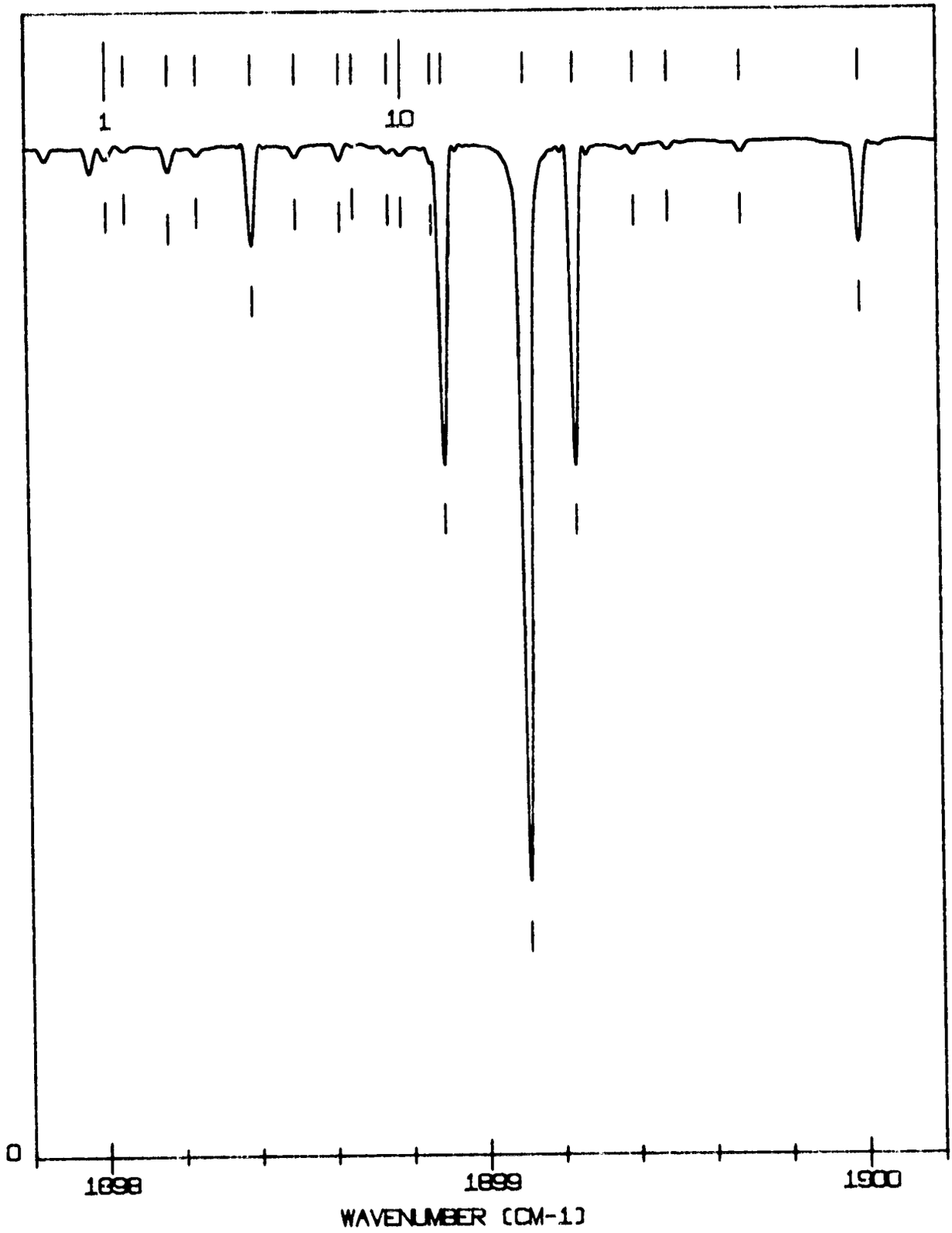


TABLE A36

Line Positions and Identifications (1900-1902 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1900.04848	1900.05019	13302-02201 626	P7
			SIDELOBE	
2	1900.23201	1900.23145	11102-00001 627	P22
3	1900.33785	1900.33796	12202-01101 626	P23
4	1900.46353	1900.46157	11102-00001 636	R4
5	1900.58969	1900.58968	11102-00001 626	P42
6	1900.74713	1900.74706	12202-01101 626	P22
7	1900.97024	1900.97060	11102-00001 627	P21
8	1901.59826	1901.59831	20003-01101 626	R25
9	1901.71213	1901.71068	11102-00001 627	P20
10	1901.75942		H2O	
11	1901.78696	1901.78718	12202-01101 626	P21
12	1901.88471	1901.88612	11102-00001 628	Q11
13	1901.91267	1901.91294	11102-00001 628	Q12
14	1901.94223	1901.94198	11102-00001 628	Q13
15	1901.97355	1901.97326	11102-00001 628	Q14

FRAME A36

9.857 Torr 384 meters

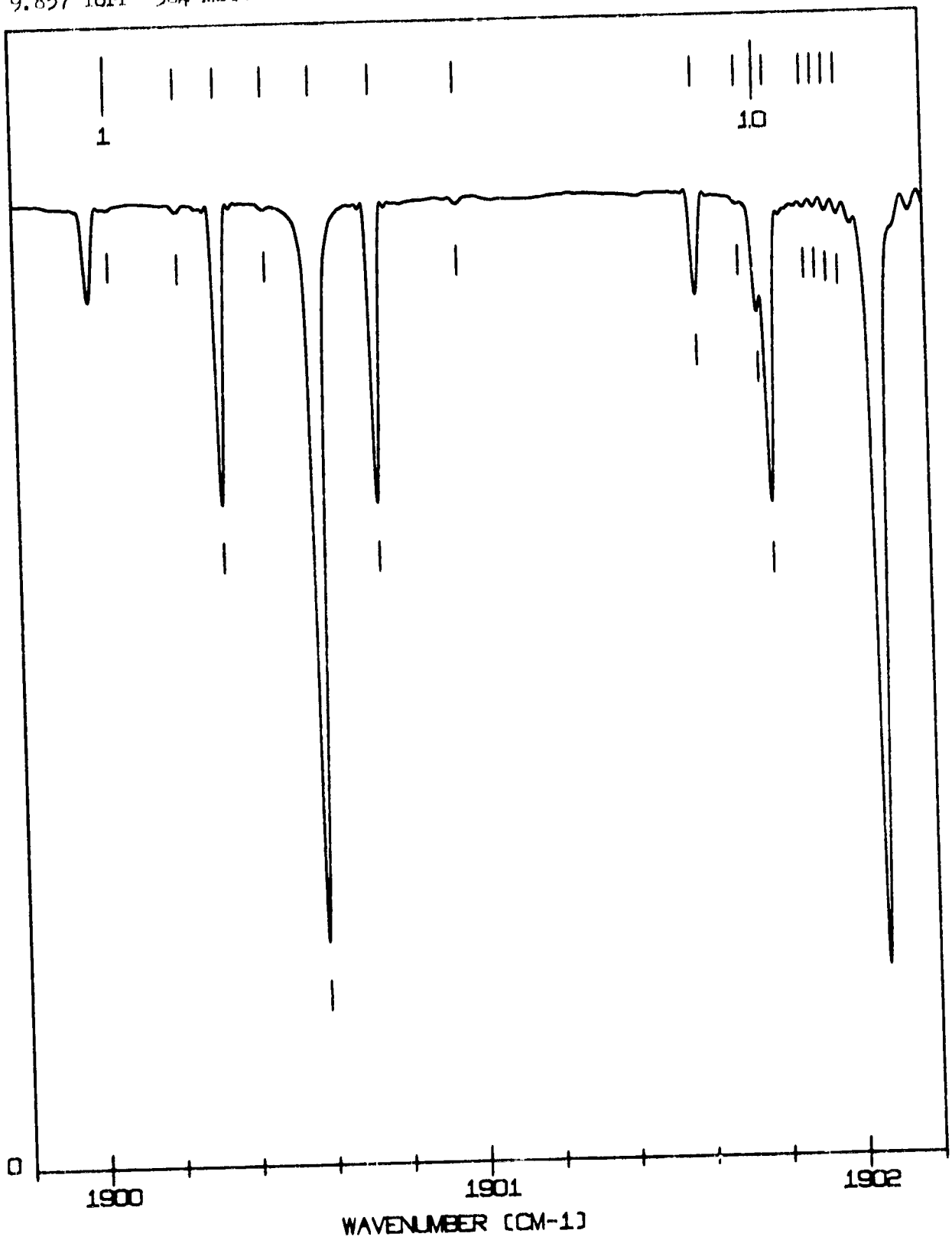


TABLE A37

Line Positions and Identifications (1902-1904 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1902.00926	1902.00676	11102-00001	628	Q15
2	1902.06843	1902.06839	11102-00001	626	P40
		1902.08041	11102-00001	628	Q17
		1902.04247	11102-00001	628	Q16
		1902.04123	11102-00001	636	R6
3	1902.12274	1902.12055	11102-00001	628	Q18
			SIDELOBE		
4	1902.16255	1902.16289	11102-00001	628	Q19
5	1902.20887	1902.20743	11102-00001	628	Q20
6	1902.25556	1902.25541	12202-01101	626	P20
		1902.25416	11102-00001	628	Q21
7	1902.30430	1902.30307	11102-00001	628	Q22
8	1902.35408	1902.35414	11102-00001	628	Q23
9	1902.40724	1902.40736	11102-00001	628	Q24
10	1902.46148	1902.46273	11102-00001	628	Q25
		1902.45173	11102-00001	627	P19
11	1902.52089	1902.52023	11102-00001	628	Q26
12	1902.57931	1902.57983	11102-00001	628	Q27
13	1902.60683		H2O		
14	1902.64142	1902.64154	11102-00001	628	Q28
15	1902.70505	1902.70532	11102-00001	628	Q29
16	1902.77129	1902.77117	11102-00001	628	Q30
17	1902.83883	1902.83905	11102-00001	628	Q31
18	1902.90890	1902.90897	11102-00001	628	Q32
19	1902.98022	1902.98089	11102-00001	628	Q33
20	1903.05513	1903.05480	11102-00001	628	Q34
21	1903.13149	1903.13068	11102-00001	628	Q35
22	1903.20290	1903.20268	20003-01101	626	R27
		1903.20852	11102-00001	628	Q36
		1903.19384	11102-00001	627	P18
23	1903.24695	1903.24700	12202-01101	626	P19
24	1903.37098	1903.37001	11102-00001	628	Q38
25	1903.45616	1903.45364	11102-00001	628	Q39
26	1903.55061	1903.55065	11102-00001	626	P38
27	1903.62184	1903.62662	11102-00001	628	Q41
28	1903.71537	1903.71598	11102-00001	628	Q42
29	1903.76921	1903.76921	12202-01101	626	P18
30	1903.80349	1903.80725	11102-00001	628	Q43
			SIDELOBE		
31	1903.90066	1903.90046	11102-00001	628	Q44
32	1903.94135	1903.93701	11102-00001	627	P17
33	1903.99721	1903.99562	11102-00001	628	Q45

FRAME A37 ORIGINAL PAGE IS OF POOR QUALITY

9.857 Torr 384 meters

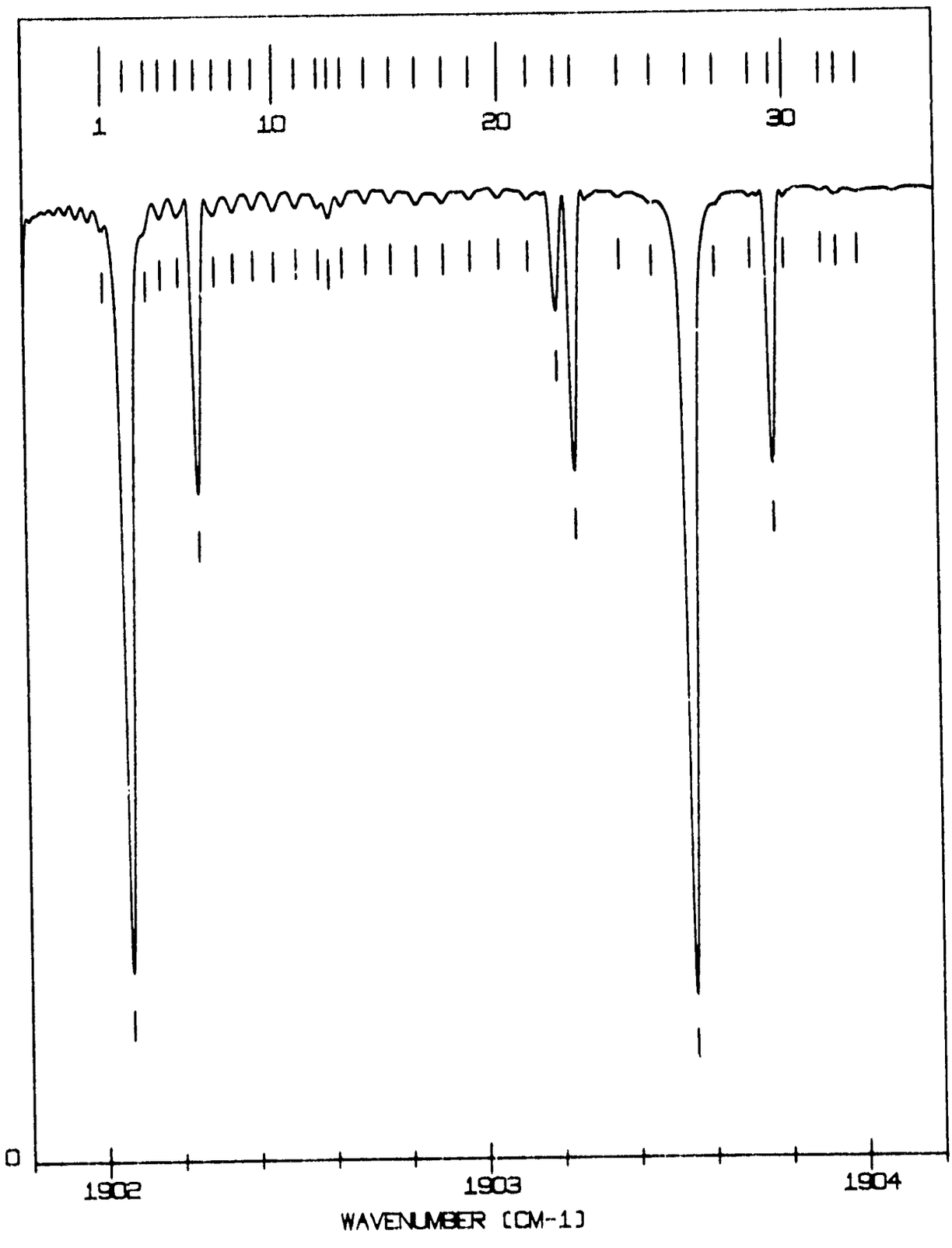


TABLE A38

Line Positions and Identifications (1904-1906 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1904.09258	1904.09277	11102-00001	628	Q46
2	1904.19209	1904.19195	11102-00001	628	Q47
3	1904.35503		H2O		
4	1904.68323	1904.68133	11102-00001	627	P16
			SIDELOBE		
5	1904.71739	1904.71742	12202-01101	626	P17
6	1904.80867	1904.80869	20003-01101	626	R29
7	1905.0365	1905.03654	11102-00001	626	P36
8	1905.28842	1905.28850	12202-01101	626	P16
9	1905.42596	1905.42685	11102-00001	627	P15
10	1905.61958	1905.62252	13302-02201	626	Q11
11	1905.64460	1905.64663	13302-02201	626	Q12
12	1905.67106	1905.67151	13302-02201	626	Q13
13	1905.69933	1905.69929	13302-02201	626	Q14
14	1905.72862	1905.72837	13302-02201	626	Q15
15	1905.75981	1905.75992	13302-02201	626	Q16
16	1905.79326	1905.79307	13302-02201	626	Q17
17	1905.82874	1905.82853	13302-02201	626	Q18
18	1905.86532	1905.86559	13302-02201	626	Q19
19	1905.90440	1905.90511	13302-02201	626	Q20
20	1905.94491	1905.94591	13302-02201	626	Q21
21	1905.98993	1905.98959	13302-02201	626	Q22

FRAME A38

9.857 Torr 384 meters

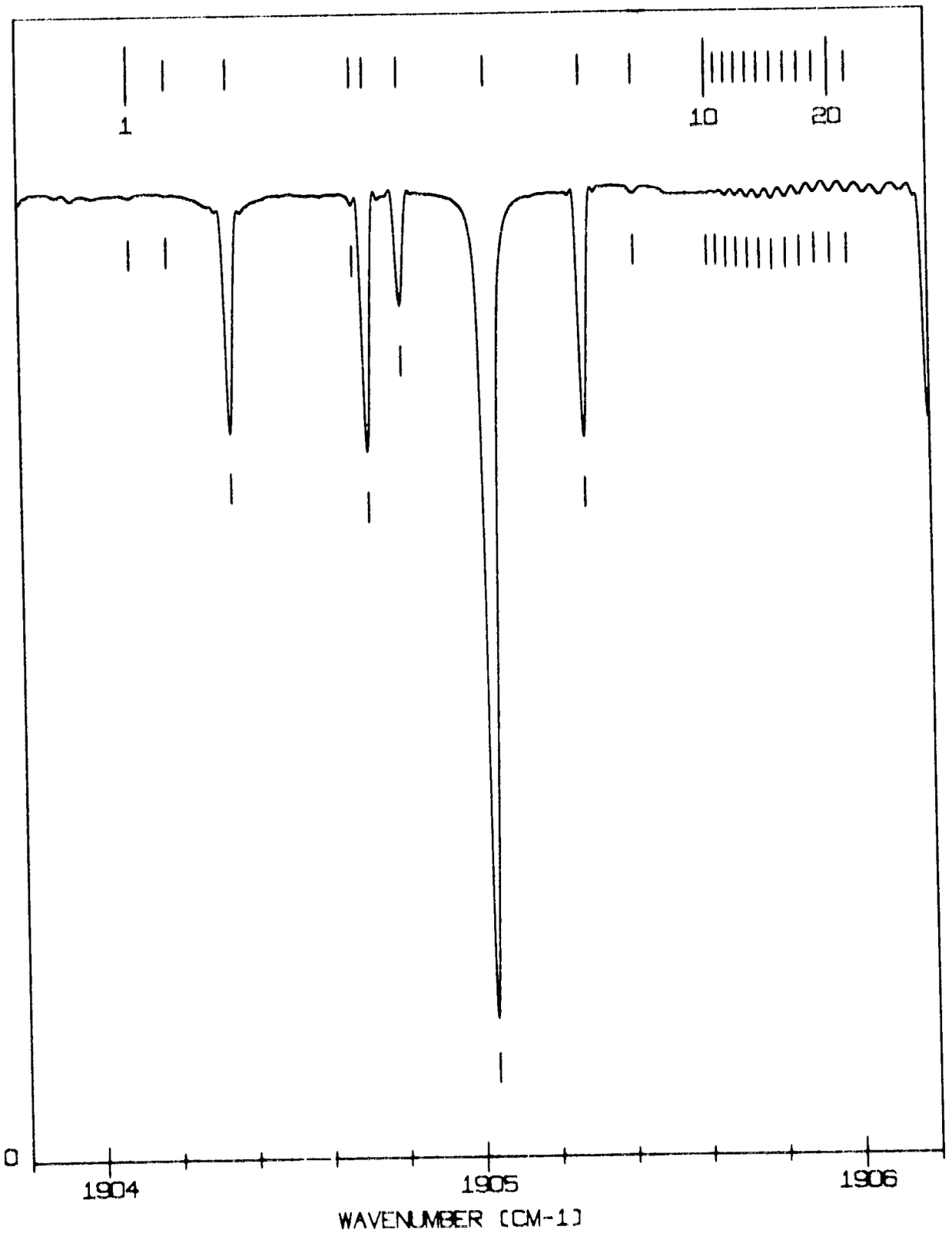


TABLE A39

Line Positions and Identifications (1906-1908 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1906.03500	1906.03397	13302-02201	626	Q23
2	1906.07445	1906.08187	13302-02201	626	Q24
			H2O?		
3	1906.13084	1906.12970	13302-02201	626	Q25
4	1906.19836	1906.19843	12202-01101	626	P15
		1906.18182	13302-02201	626	Q26
		1906.23302	13302-02201	626	Q27
		1906.17364	11102-00001	627	P14
5	1906.28967	1906.28926	13302-02201	626	Q28
6	1906.34449	1906.34383	13302-02201	626	Q29
7	1906.41577	1906.41606	20003-01101	626	R31
		1906.40402	13302-02201	626	Q30
		1906.46204	13302-02201	626	Q31
8	1906.52616	1906.52614	11102-00001	626	P34
		1906.52591	13302-02201	626	Q32
		1906.58755	13302-02201	626	Q33
9	1906.64961	1906.65477	13302-02201	626	Q34
10	1906.72018	1906.72026	13302-02201	626	Q35
11	1906.81320	1906.81332	12202-01101	626	P14
12	1906.86356	1906.86013	13302-02201	626	Q37
13	1906.91356	1906.92178	11102-00001	627	P13
		1906.93329	13302-02201	626	Q38
14	1907.00579	1907.00715	13302-02201	626	Q39
15	1907.08312	1907.08330	13302-02201	626	Q40
16	1907.16652	1907.16140	13302-02201	626	Q41
17	1907.24097	1907.24112	13302-02201	626	Q42
18	1907.32144	1907.32306	13302-02201	626	Q43
19	1907.40930	1907.40774	13302-02201	626	Q44
20	1907.49391	1907.49247	13302-02201	626	Q45
21	1907.53474		?		
22	1907.58137	1907.58468	13302-02201	626	Q46
23	1907.68729	1907.69001	12202-01101	626	P13
			H2O		
24	1907.71252		H2O		
25	1907.95881		H2O		

FRAME A39

9.857 Torr 384 meters

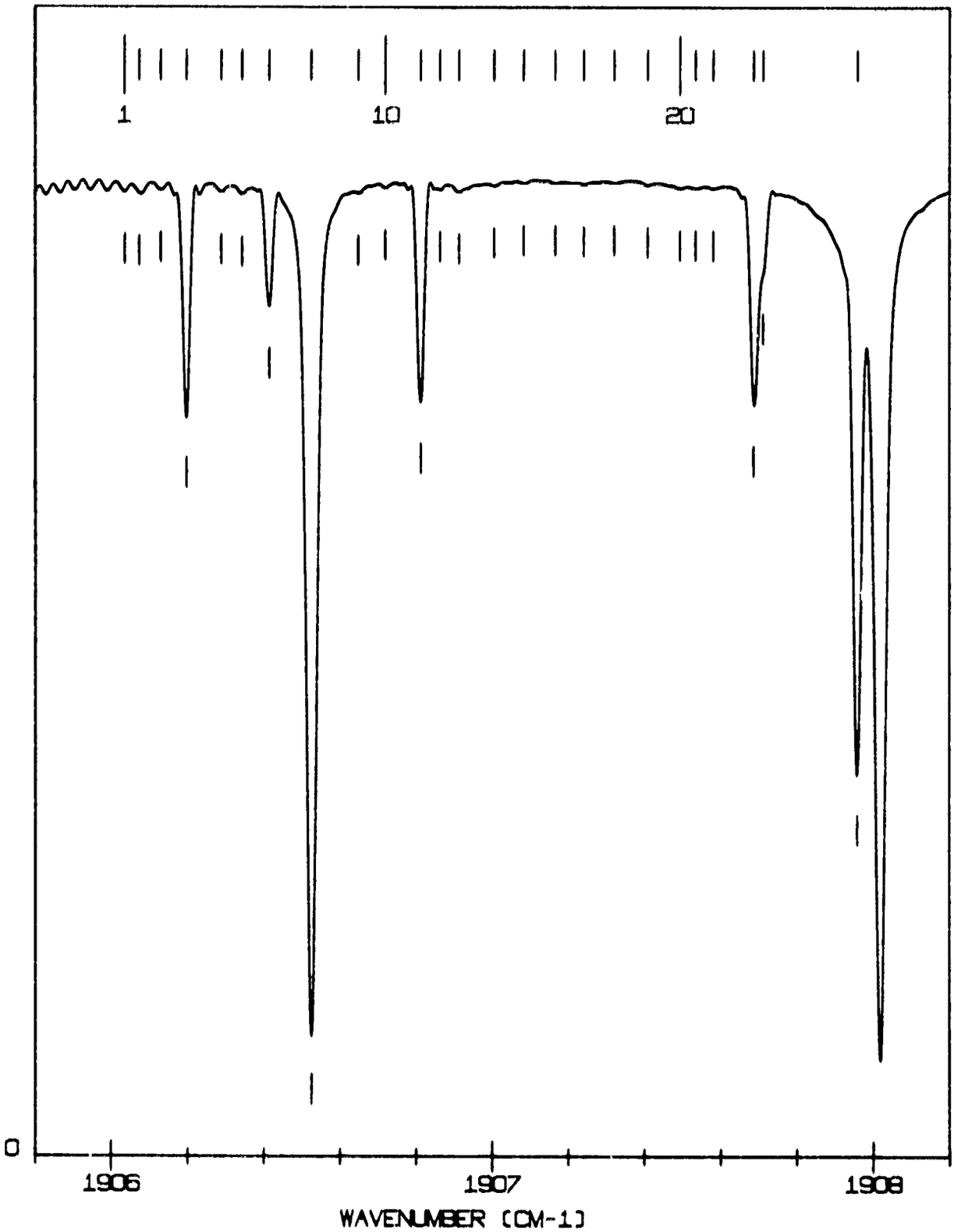


TABLE A40

Line Positions and Identifications (1908-1910 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1908.01944	1908.01953	11102-00001 626	P32
		1908.02451	20003-01101 626	R33
2	1908.12141		H2O?	
3	1908.34361	1908.34367	12202-01101 626	P12
4	1908.64445	1908.64508	13302-02201 626	R3
5	1909.19238	1909.19217	12202-01101 626	P11
6	1909.51680	1909.51678	11102-00001 626	P30
7	1909.63373	1909.63373	20003-01101 626	R35
8	1909.88064	1909.87957	12202-01101 626	P10
9	1909.96393		H2O	

FRAME A40

9.357 Torr 384 meters

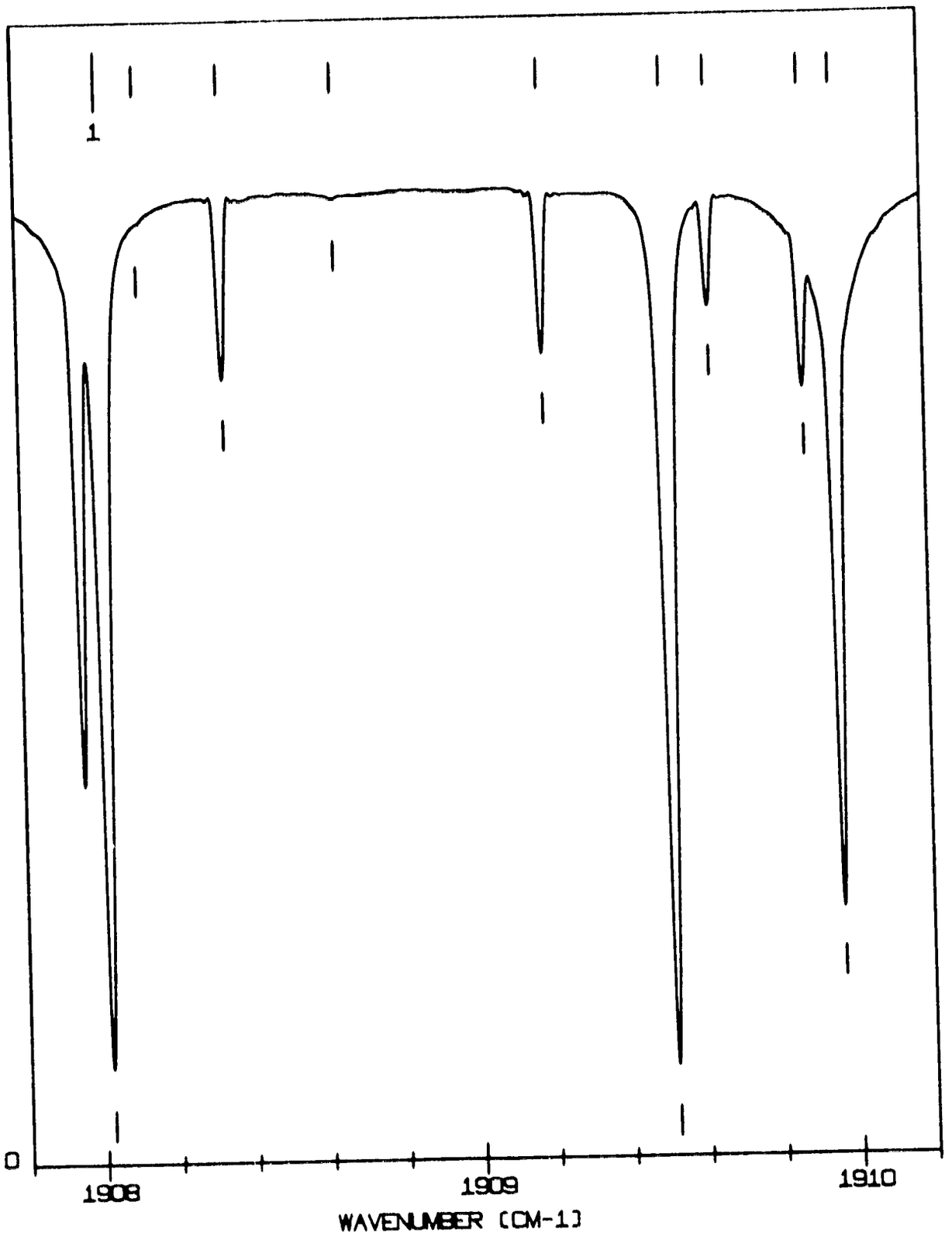


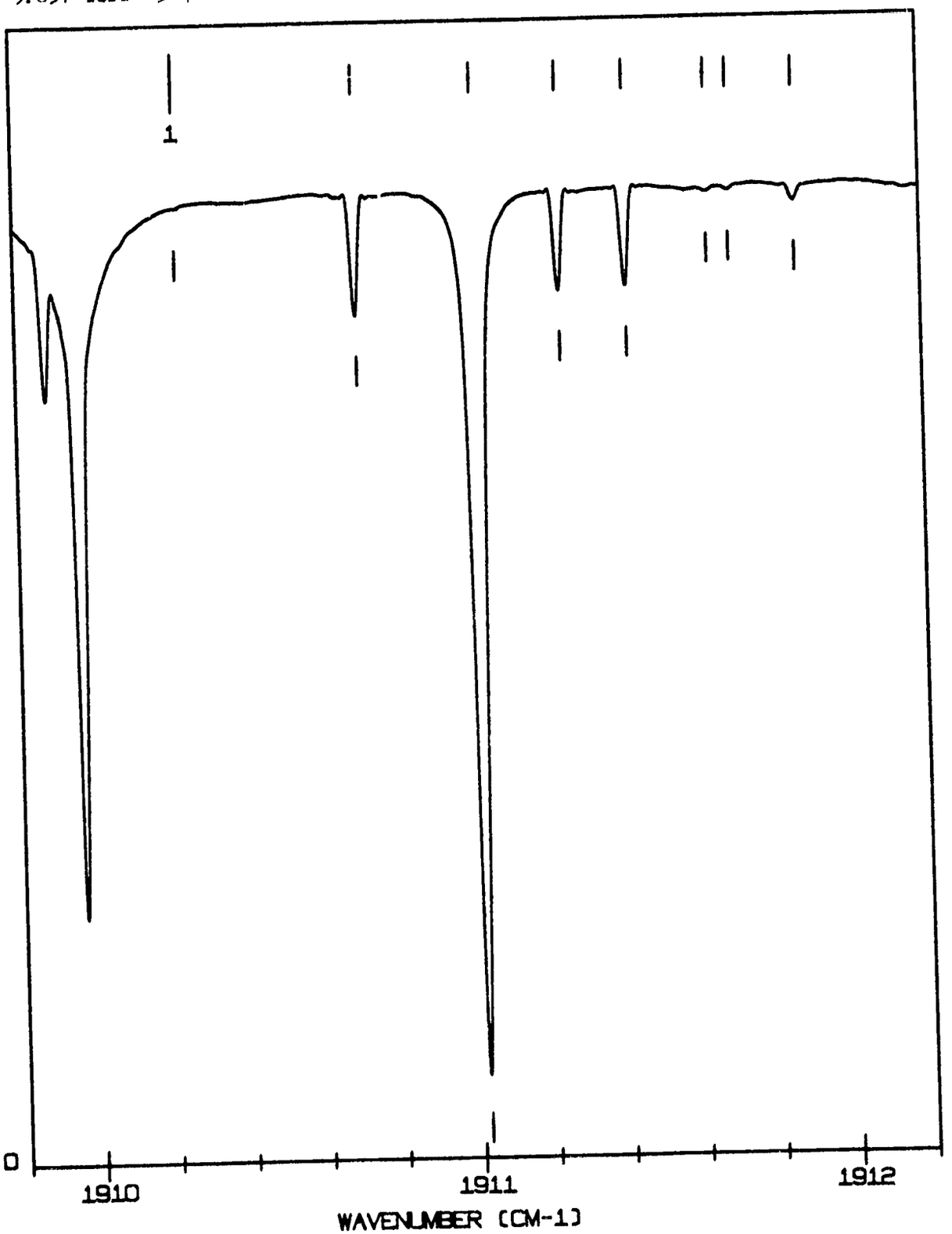
TABLE A41

Line Positions and Identifications (1910-1912 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1910.22755	1910.23346	13302-02201 626	R5
2	1910.70491	1910.70488	12202-01101 626	P9
3	1911.01798	1911.01796	11102-00001 626	P28
4	1911.24341	1911.24340	20003-01101 626	R37
5	1911.42076	1911.42104	12202-01101 626	P8
6	1911.63670	1911.63683	11102-00001 626	R18
7	1911.69478	1911.69572	21102-10001 626	P50
8	1911.86855		H2O	

FRAME A41

9.857 Torr 384 meters



C-2

TABLE A42

Line Positions and Identifications (1912-1914 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1912.22803	1912.22812	12202-01101 626	P7
2	1912.52321	1912.52313	11102-00001 626 H2O	P26
3	1912.69856	1912.69895	21103-10002 626	R20
4	1912.85312	1912.85319	20003-01101 626	R39
5	1912.96794	1912.96807	12202-01101 626	P6
6	1913.25590	1913.25441	11102-00001 636	R20
7	1913.30238	1913.30091	21102-10001 626	P48
8	1913.76188	1913.76189	12202-01101 626	P5
9	1913.93132		H2O	

FRAME A42

9.857 Torr 884 meters

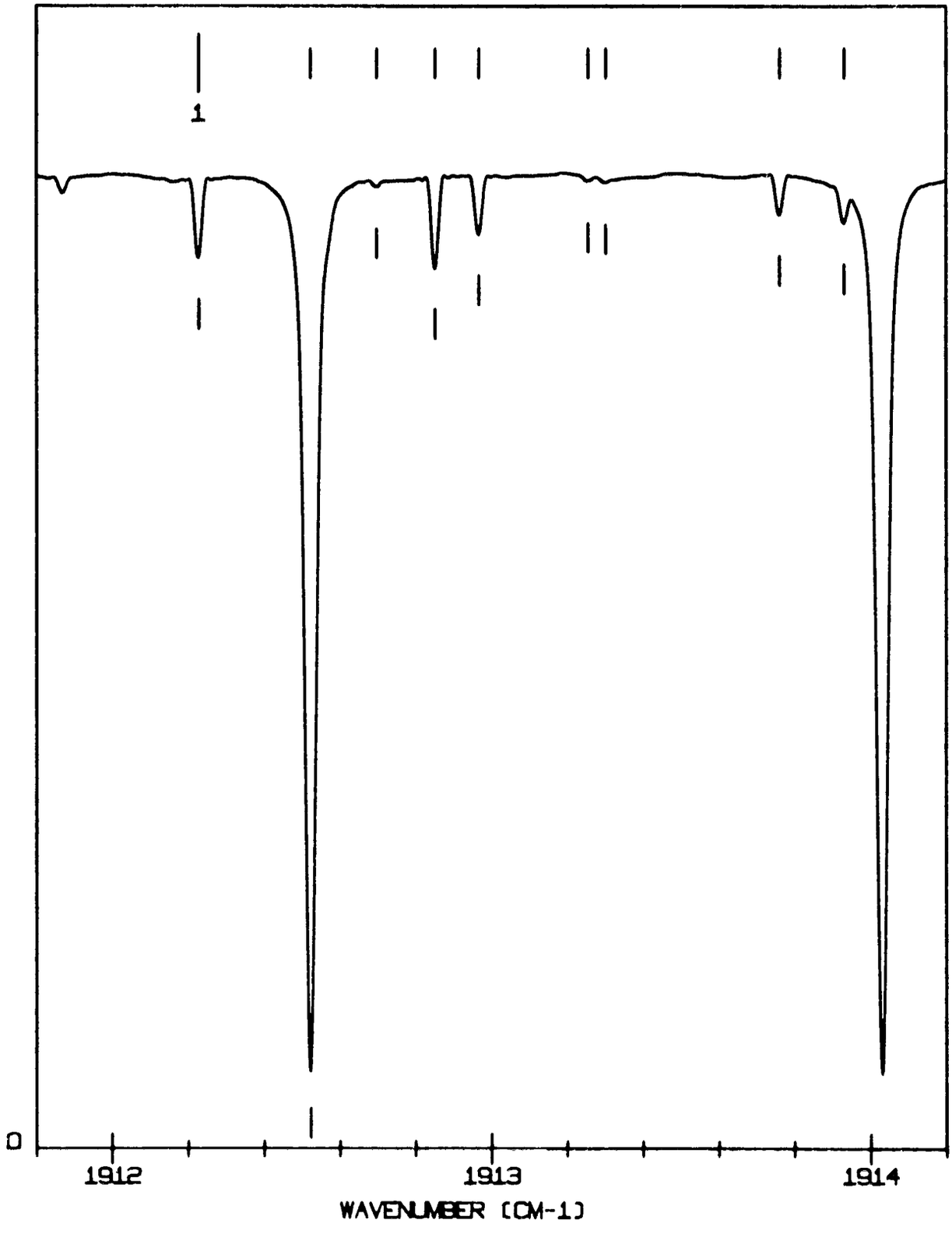


TABLE A43

Line Positions and Identifications (1914-1916 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1914.03232	1914.03235	11102-00001 626	P24
2	1914.30545	1914.30713	21103-10002 626	R22
3	1914.46287	1914.46277	20003-01101 626	R41
4	1914.52091	1914.52065	12202-01101 626	P4
5	1914.58029		H2O	
6	1914.87795	1914.87768	11102-00001 636	R22
7	1914.90219	1914.90285	21102-10001 626	P46
8	1915.19472		H2O	
9	1915.27035		H2O	
10	1915.30624	1915.30614	12202-01101 626	P3
11	1915.54567	1915.54565	11102-00001 626	P22
12	1915.91920	1915.91909	21103-10002 626	R24

FRAME A43

9.857 Torr 384 meters

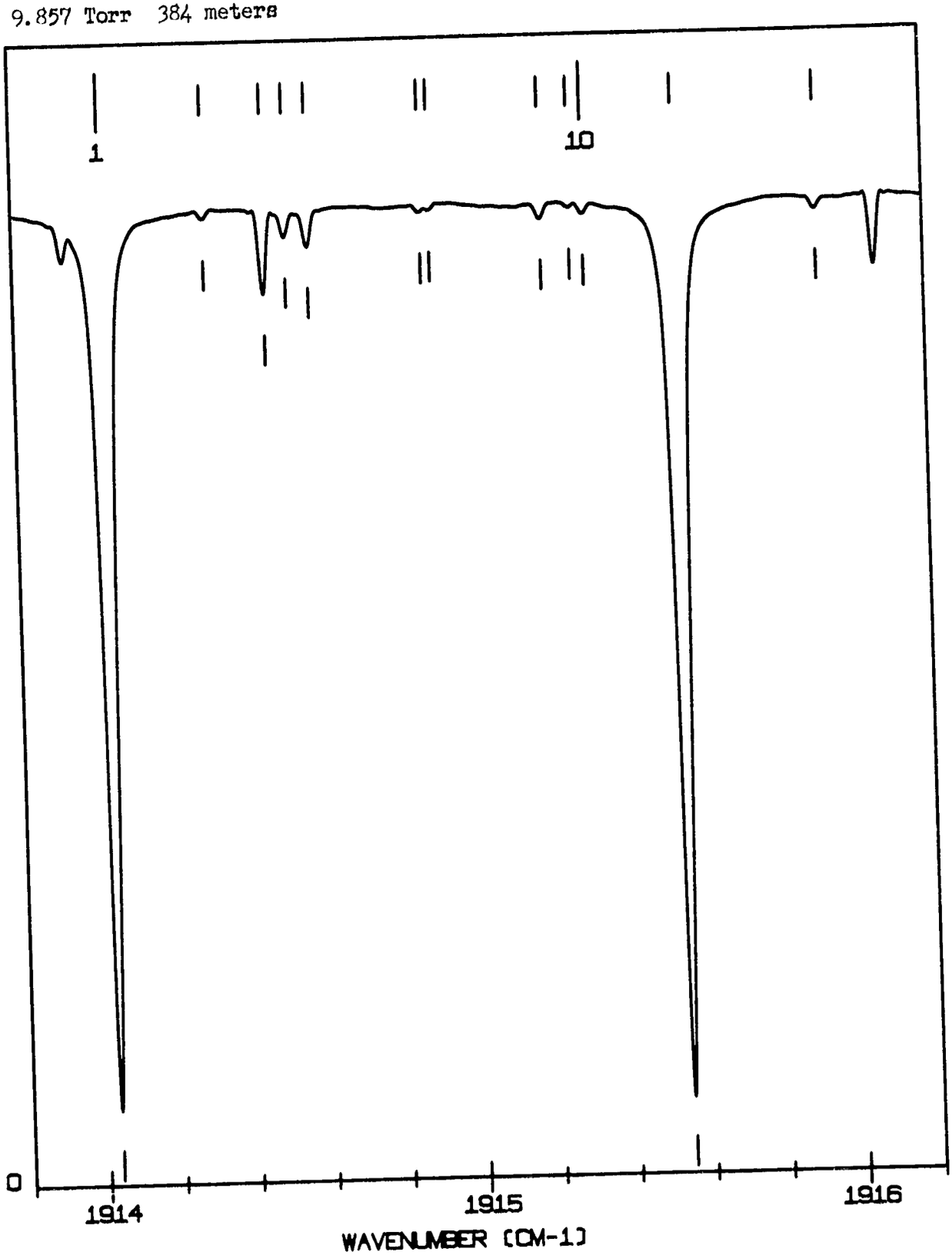


TABLE A44

Line Positions and Identifications (1916-1918 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1916.07167	1916.07176	20003-01101 626	R43
2	1916.50519	1916.50171	21102-10001 626	P44
		1916.50603	11102-00001 636	R24
3	1916.80420	1916.80670	11102-00001 627	Q9
			H2O?	
4	1916.83367	1916.83374	11102-00001 627	Q10
5	1916.86518	1916.86270	11102-00001 627	Q11
6	1916.89165	1916.89359	11102-00001 627	Q12
7	1916.92830	1916.92647	11102-00001 627	Q13
8	1917.06312	1917.06309	11102-00001 626	P20
9	1917.22667	1917.22820	11102-00001 627	Q20
10	1917.28354	1917.28331	11102-00001 627	Q21
11	1917.34139	1917.34077	11102-00001 627	Q22
12	1917.39763	1917.39944	11102-00001 627	Q23
13	1917.45783	1917.45750	11102-00001 627	Q24
14	1917.53265	1917.53476	21103-10002 626	R26
		1917.51228	11102-00001 627	Q25
15	1917.68323	1917.64840	12202-01101 626	Q2
		1917.65547	12202-01101 626	Q3
		1917.65791	12202-01101 626	Q4
		1917.67905	12202-01101 626	Q5
		1917.67285	12202-01101 626	Q6
		1917.69324	12202-01101 626	Q8
		1917.67980	20003-01101 626	R45
16	1917.71684	1917.71308	12202-01101 626	Q7
		1917.71908	12202-01101 626	Q10
17	1917.75423	1917.75752	12202-01101 626	Q9
		1917.75037	12202-01101 626	Q12
18	1917.78714	1917.78712	12202-01101 626	Q14
19	1917.82285	1917.81235	12202-01101 626	Q11
		1917.82934	12202-01101 626	Q16
20	1917.87907	1917.87751	12202-01101 626	Q13
		1917.87704	12202-01101 626	Q18
21	1917.96015	1917.95295	12202-01101 626	Q15
		1917.93020	12202-01101 626	Q20

FRAME A44

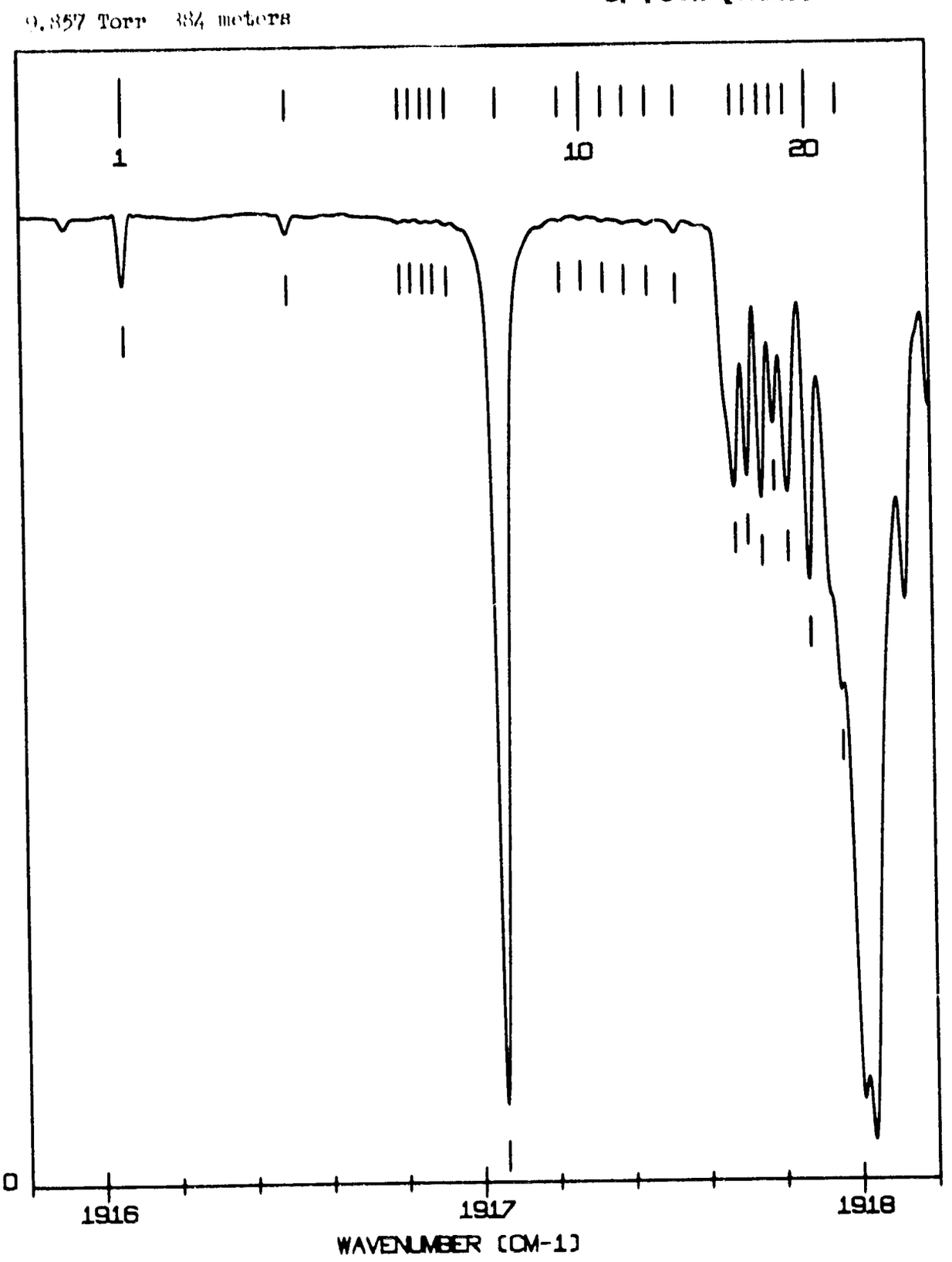


TABLE A45

Line Positions and Identifications (1918-1920 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
			H2O	
1	1918.00833	1917.98882	12202-01101 626	Q22
			H2O	
2	1918.03416	1918.03861	12202-01101 626	Q17
		1918.05289	12202-01101 626	Q24
3	1918.12752	1918.13441	12202-01101 626	Q19
		1918.12239	12202-01101 626	Q26
		1918.13937	11102-00001 636	R26
		1918.09770	21102-10001 626	P42
4	1918.19695	1918.19728	12202-01101 626	Q28
5	1918.24012	1918.24030	12202-01101 626	Q21
6	1918.27751	1918.27754	12202-01101 626	Q30
			H2O?	
7	1918.35909	1918.35619	12202-01101 626	Q23
		1918.36312	12202-01101 626	Q32
8	1918.45424	1918.45395	12202-01101 626	Q34
9	1918.48231	1918.48201	12202-01101 626	Q25
10	1918.58469	1918.58470	11102-00001 626	P18
		1918.61766	12202-01101 626	Q27
		1918.54999	12202-01101 626	Q36
11	1918.65131	1918.65117	12202-01101 626	Q38
12	1918.76183	1918.76307	12202-01101 626	Q29
		1918.75740	12202-01101 626	Q40
13	1918.86842	1918.86863	12202-01101 626	Q42
14	1918.91815	1918.91816	12202-01101 626	Q31
15	1918.98527	1918.98478	12202-01101 626	Q44
16	1919.08330	1919.08281	12202-01101 626	Q33
		1919.10579	12202-01101 626	Q46
17	1919.15520	1919.15409	21103-10002 626	R28
18	1919.21376	1919.21255	12202-01101 626	R1
		1919.23163	12202-01101 626	Q48
19	1919.25671	1919.25695	12202-01101 626	Q35
20	1919.28709	1919.28651	20003-01101 626	R47
21	1919.36213	1919.36227	12202-01101 626	Q50
22	1919.44048	1919.44047	12202-01101 626	Q37
23	1919.51224	1919.49772	12202-01101 626	Q52
			H2O	
24	1919.63389	1919.63326	12202-01101 626	Q39
25	1919.68863	1919.69097	21102-10001 626	P40
			H2O	
26	1919.77751	1919.77760	11102-00001 636	R28
27	1919.83505	1919.83520	12202-01101 626	Q41
28	1919.99867	1919.99820	12202-01101 626	R2

FRAME A45

9.857 Torr 384 meters

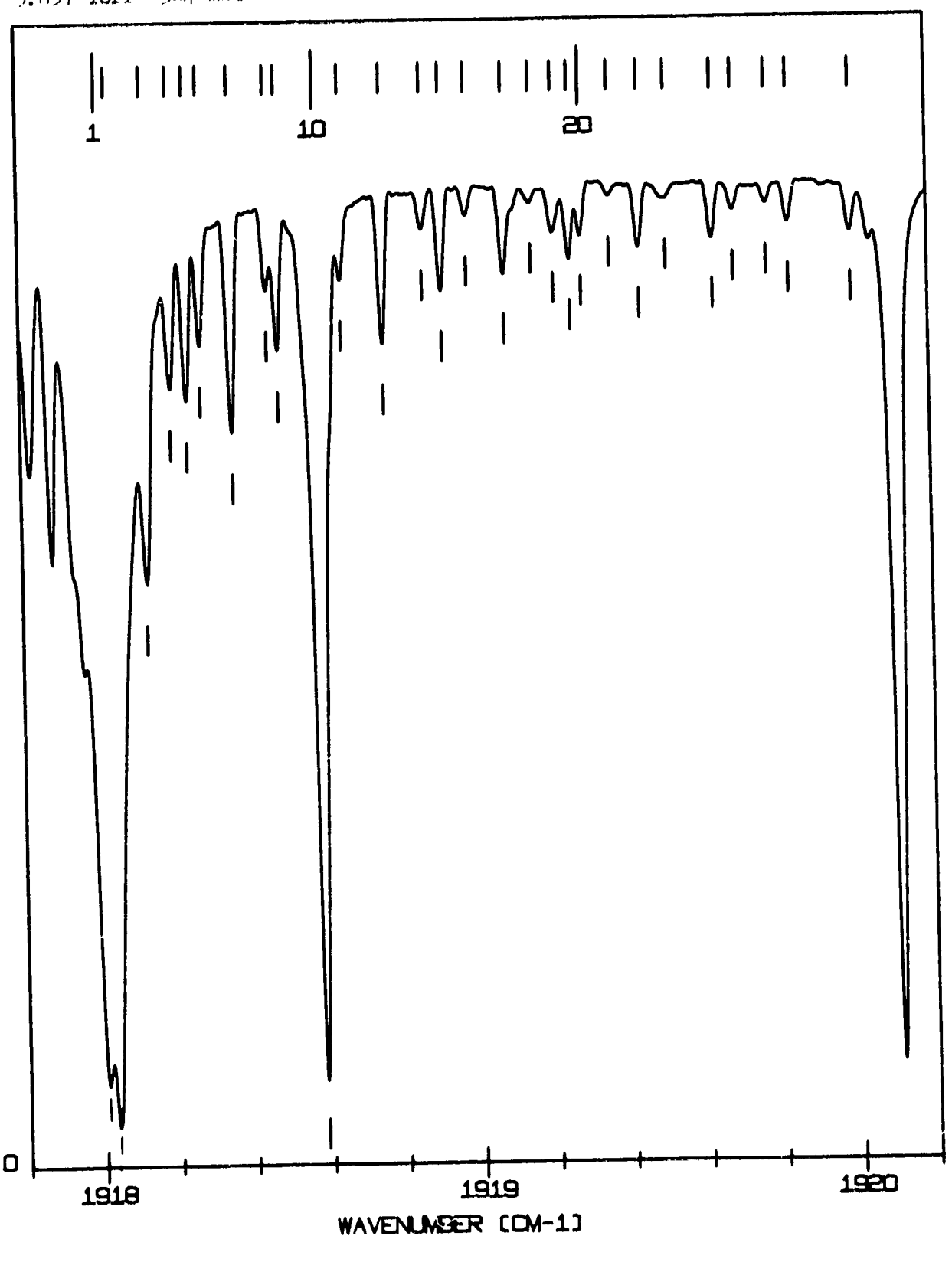


TABLE A46

Line Positions and Identifications (1920-1922 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1920.04796	1920.04616	12202-01101 626	Q43
2	1920.11050	1920.11051	11102-00001 626	P16
3	1920.26550	1920.26598	12202-01101 626	Q45
4	1920.49433	1920.49448	12202-01101 626	Q47
5	1920.73118	1920.73146	12202-01101 626	Q49
6	1920.79131	1920.79334	12202-01101 626	R3
		1920.77700	21103-10002 626	R30
7	1920.89166	1920.89149	20003-01101 626	R49
			H2O?	
8	1920.91279		H2O	
9	1920.97727	1920.97668	12202-01101 626	Q51
10	1921.22981	1921.22982	12202-01101 626	Q53
11	1921.28158	1921.28169	21102-10001 626	P38
12	1921.42177	1921.42059	11102-00001 636	R30
13	1921.49049	1921.49054	12202-01101 626	Q55
14	1921.57582	1921.57554	12202-01101 626	R4
15	1921.64054	1921.64055	11102-00001 626	P14
16	1921.85604	1921.85525	11102-00001 628	R26

FRAME A46

9.857 Torr 384 meters

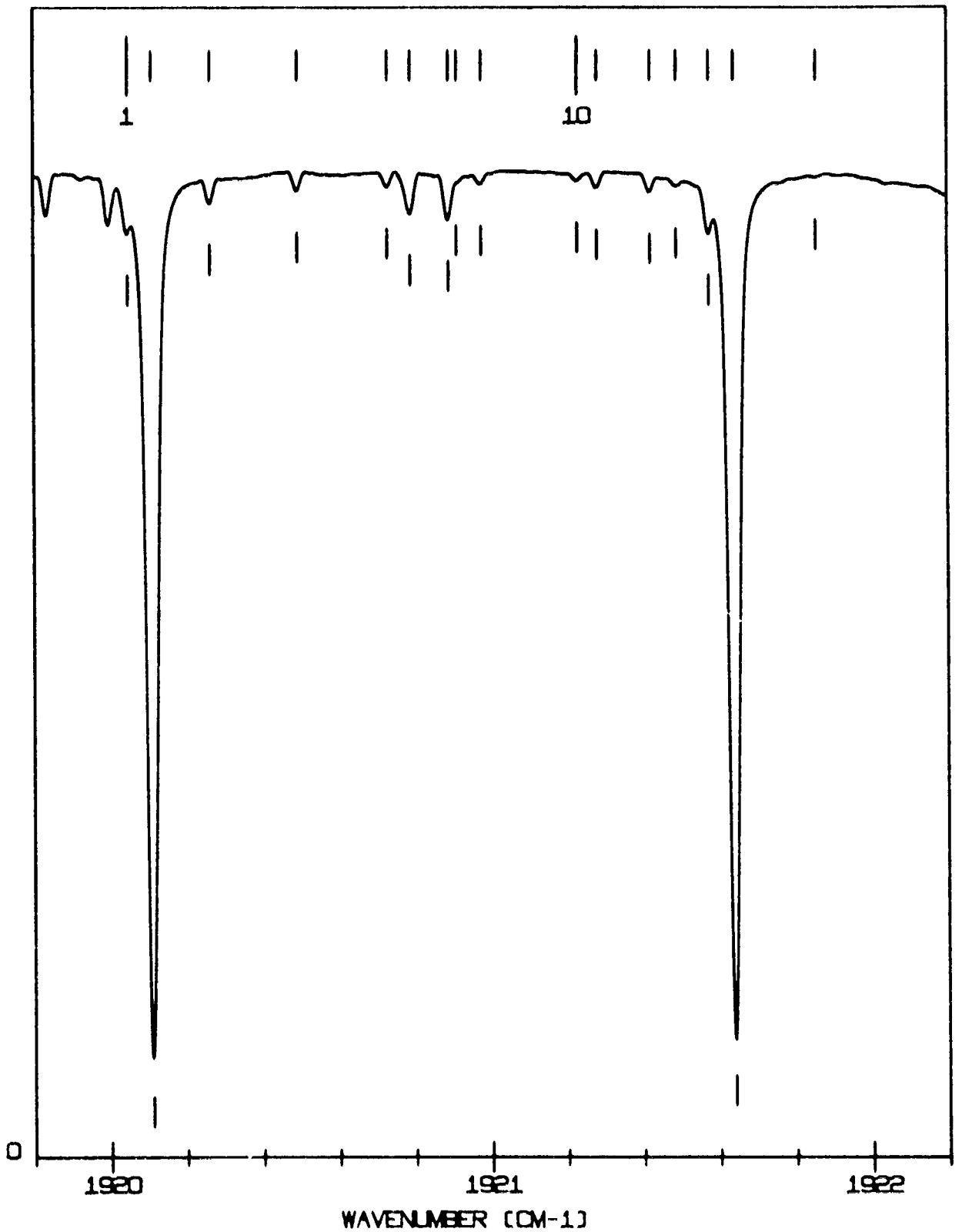


TABLE A47

Line Positions and Identifications (1922-1924 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
			H2O		
1	1922.34041				
2	1922.37871	1922.38452	12202-01101	626	R5
		1922.40341	21103-10002	626	R32
3	1922.49287	1922.49435	20003-01101	626	R51
4	1922.60999	1922.60823	11102-00001	628	R27
5	1922.87126	1922.87003	21102-10001	626	P36
			H2O		
6	1923.16698				
		1923.17484	11102-00001	626	P12
		1923.15829	12202-01101	626	R6
		1923.06824	11102-00001	636	R32
7	1923.98602	1923.98604	12202-01101	626	R7

FRAME A47

9.857 Torr 384 meters

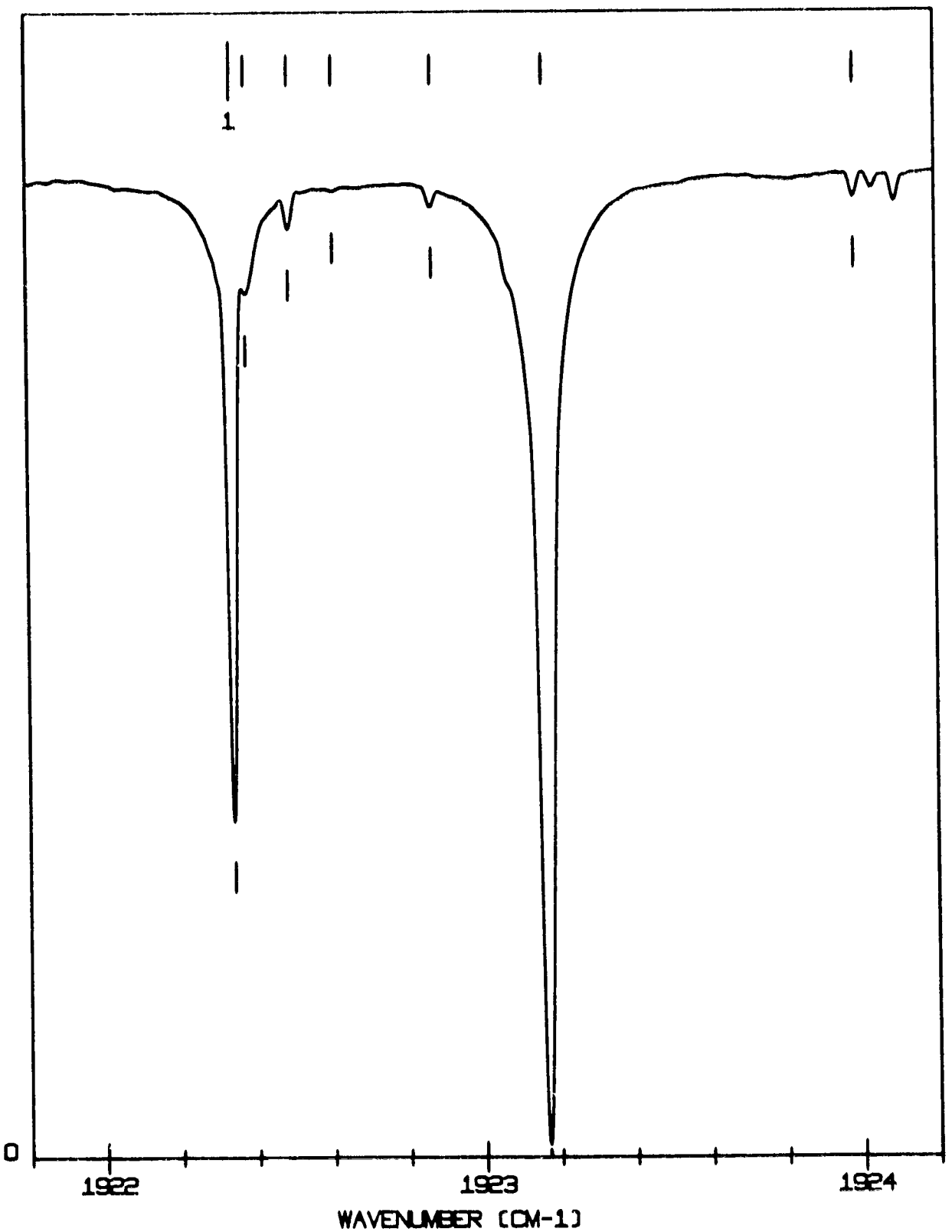


TABLE A48

Line Positions and Identifications (1924-1926 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1924.03322	1924.03326	21103-10002 626	R34
2	1924.09437	1924.09467	20003-01101 626	R53
3	1924.45512	1924.45611	21102-10001 626	P34
4	1924.71344	1924.71339	11102-00001 626	P10
		1924.74640	12202-01101 626	R8
		1924.72041	11102-00001 636	R34
5	1924.87152	1924.86994	11102-00001 628	R30
6	1925.06752		H2O	
7	1925.59766	1925.59787	12202-01101 626	R9
8	1925.62559	1925.62472	11102-00001 628	R31
9	1925.66420	1925.66646	21103-10002 626	R36
10	1925.69260	1925.69203	20003-01101 626	R55

FRAME A48

9.857 Torr 384 meters

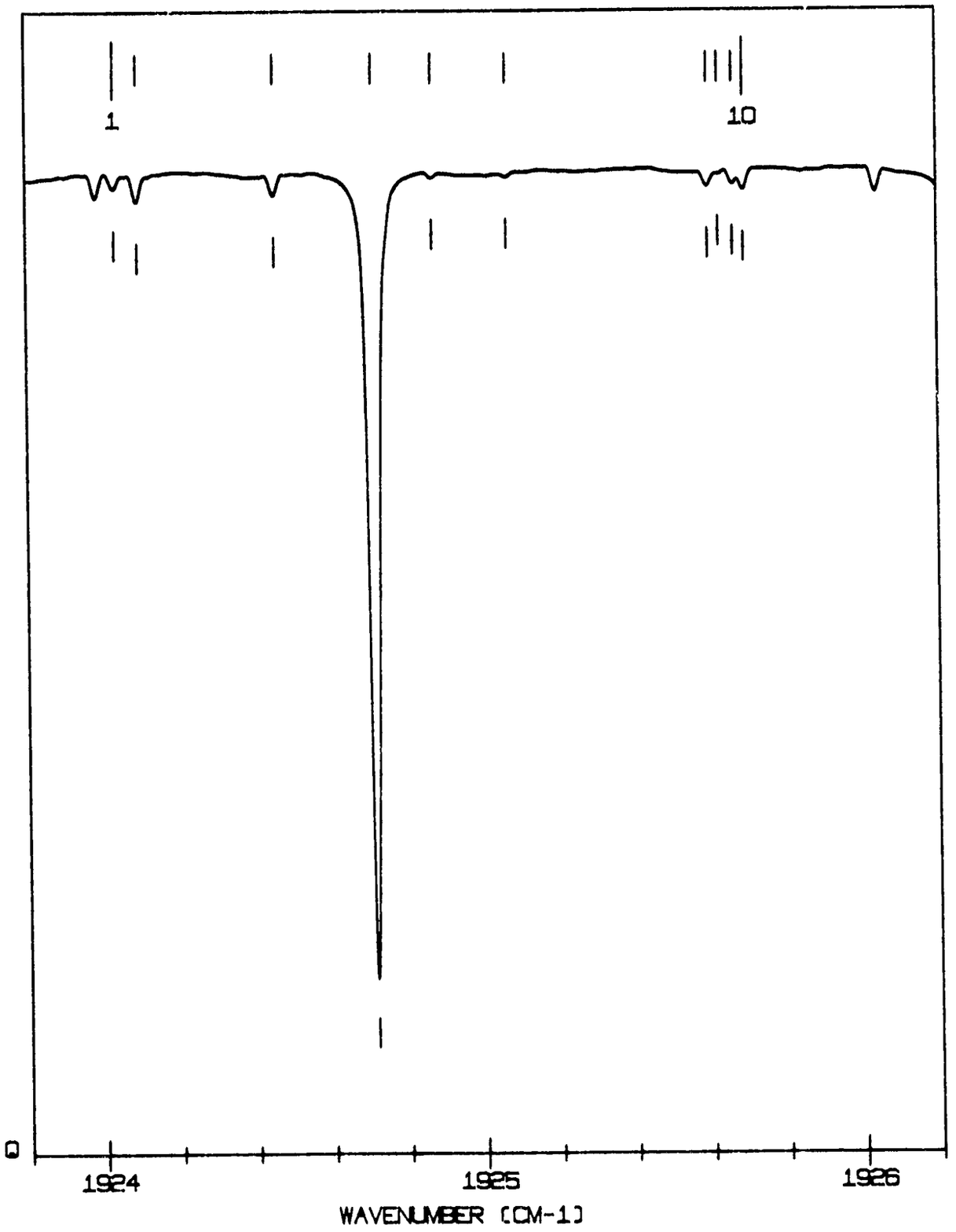


TABLE A49

Line Positions and Identifications (1926-1928 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1926.04034	1926.04009	21102-10001 626	P32
2	1926.25618	1926.25620	11102-00001 626	P8
3	1926.33832	1926.33983	12202-01101 626	R10
4	1926.37724	1926.37697	11102-00001 636	R36
		1926.37992	11102-00001 628	R32
5	1926.53636	1926.53847	13302-02201 626	R25
6	1926.72561		H2O	
7	1927.13470	1927.13553	11102-00001 628	R33
8	1927.22129	1927.21998	12202-01101 626	R11
9	1927.29388	1927.28599	20003-01101 626	R57
		1927.30293	21103-10002 626	R38
10	1927.37365	1927.37203	13302-02201 626	R26
11	1927.62118	1927.62207	21102-10001 626	P30
12	1927.80330	1927.80327	11102-00001 626	P6
13	1927.93680	1927.93850	12202-01101 626	R12

FRAME A49

9.857 Torr 384 meters

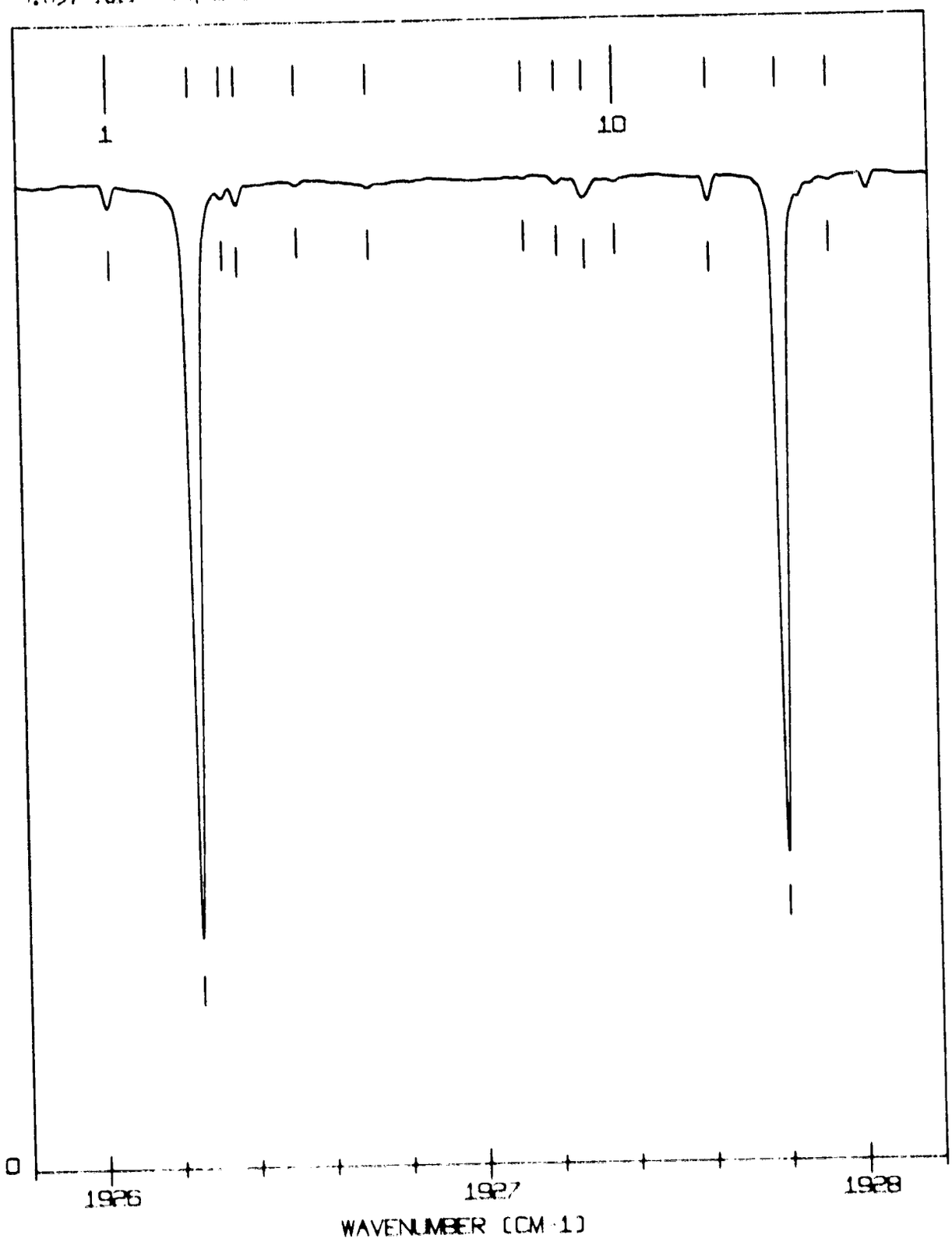


TABLE A50

Line Positions and Identifications (1928-1930 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1928.03806	1928.03778	11102-00001 636	R38
2	1928.20866	1928.20969	13302-02201 626	R27
3	1928.64881	1928.64791	11102-00001 628	R35
4	1928.87529	1928.87613	20003-01101 626	R59
5	1928.94282	1928.94258	21103-10002 626	R40
6	1929.04631	1929.04709	13302-02201 626	R28
7	1929.20183	1929.20219	21102-10001 626	P28
8	1929.35462	1929.35461	11102-00001 626	P4
9	1929.70243	1929.70271	11102-00001 636	R40
10	1929.88859	1929.88800	13302-02201 626	R29

FRAME A50

9.857 Torr 384 meters

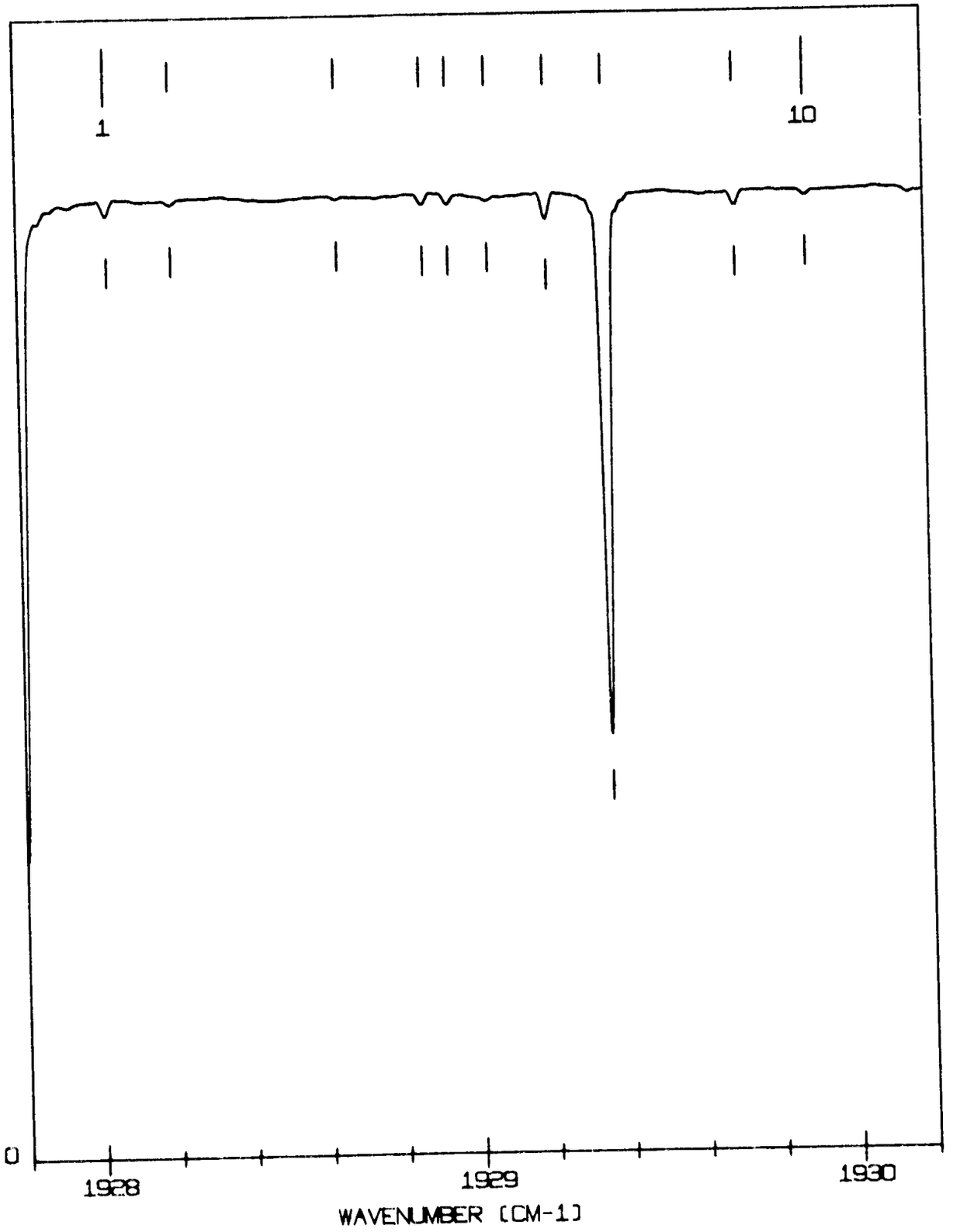


TABLE A51

Line Positions and Identifications (1930-1932 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1930.16181	1930.16175	11102-00001 628	R37
2	1930.46295	1930.46198	20003-01101 626	R61
3	1930.58582	1930.58534	21103-10002 626	R42
4	1930.72955	1930.72926	13302-02201 626	R30
5	1930.78063	1930.78055	21102-10001 626	P26
6	1930.91025	1930.91020	11102-00001 626	P2
7	1931.15002	1931.15134	12202-01101 626	R16
8	1931.37146	1931.37159	11102-00001 636	R42
9	1931.57389	1931.57330	13302-02201 626	R31
10	1931.67543	1931.67694	11102-00001 628	R39

FRAME A51

9.857 Torr 384 meters

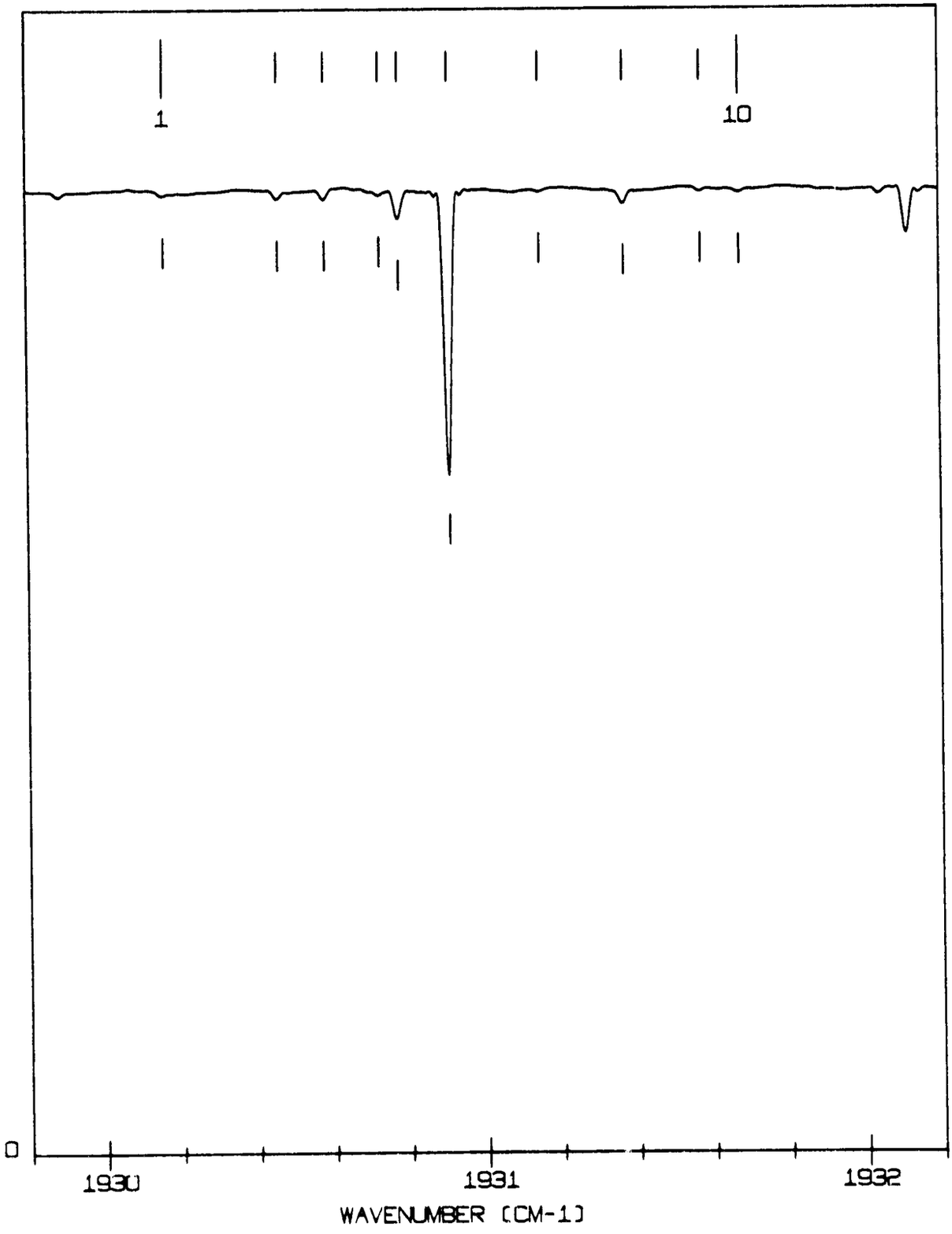


TABLE A52

Line Positions and Identifications (1932-1934 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1932.04335	1932.04311	20003-01101 626	R63
2	1932.11649		H2O	
3	1932.14946	1932.14758	12202-01101 626	R17
			SIDELOBE	
4	1932.23175	1932.23111	21103-10002 626	R44
5	1932.35711	1932.35724	21102-10001 626	P24
6	1932.39052		H2O	
7	1932.49738	1932.47886	11102-00001 626	Q2
		1932.49945	11102-00001 626	Q4
8	1932.53197	1932.53178	11102-00001 626	Q6
9	1932.57578	1932.57584	11102-00001 626	Q8
10	1932.63157	1932.63158	11102-00001 626	Q10
11	1932.69898	1932.69898	11102-00001 626	Q12
12	1932.77796	1932.77797	11102-00001 626	Q14
13	1932.86849	1932.86850	11102-00001 626	Q16
14	1932.97052	1932.97050	11102-00001 626	Q18
15	1933.08394	1933.08389	11102-00001 626	Q20
		1933.04429	11102-00001 636	R44
16	1933.16529		H2O	
17	1933.20854	1933.20860	11102-00001 626	Q22
		1933.19336	11102-00001 628	R41
18	1933.25101	1933.25151	11102-00001 626	R0
19	1933.34454	1933.34452	11102-00001 626	Q24
20	1933.49159	1933.49156	11102-00001 626	Q26
21	1933.64959	1933.64960	11102-00001 626	Q28
22	1933.81849	1933.81853	11102-00001 626	Q30
23	1933.87590	1933.87979	21103-10002 626	R46
24	1933.93377	1933.93237	21102-10001 626	P22
25	1933.99825	1933.99821	11102-00001 626	Q32

FRAME A52

0.857 Torr 384 meters

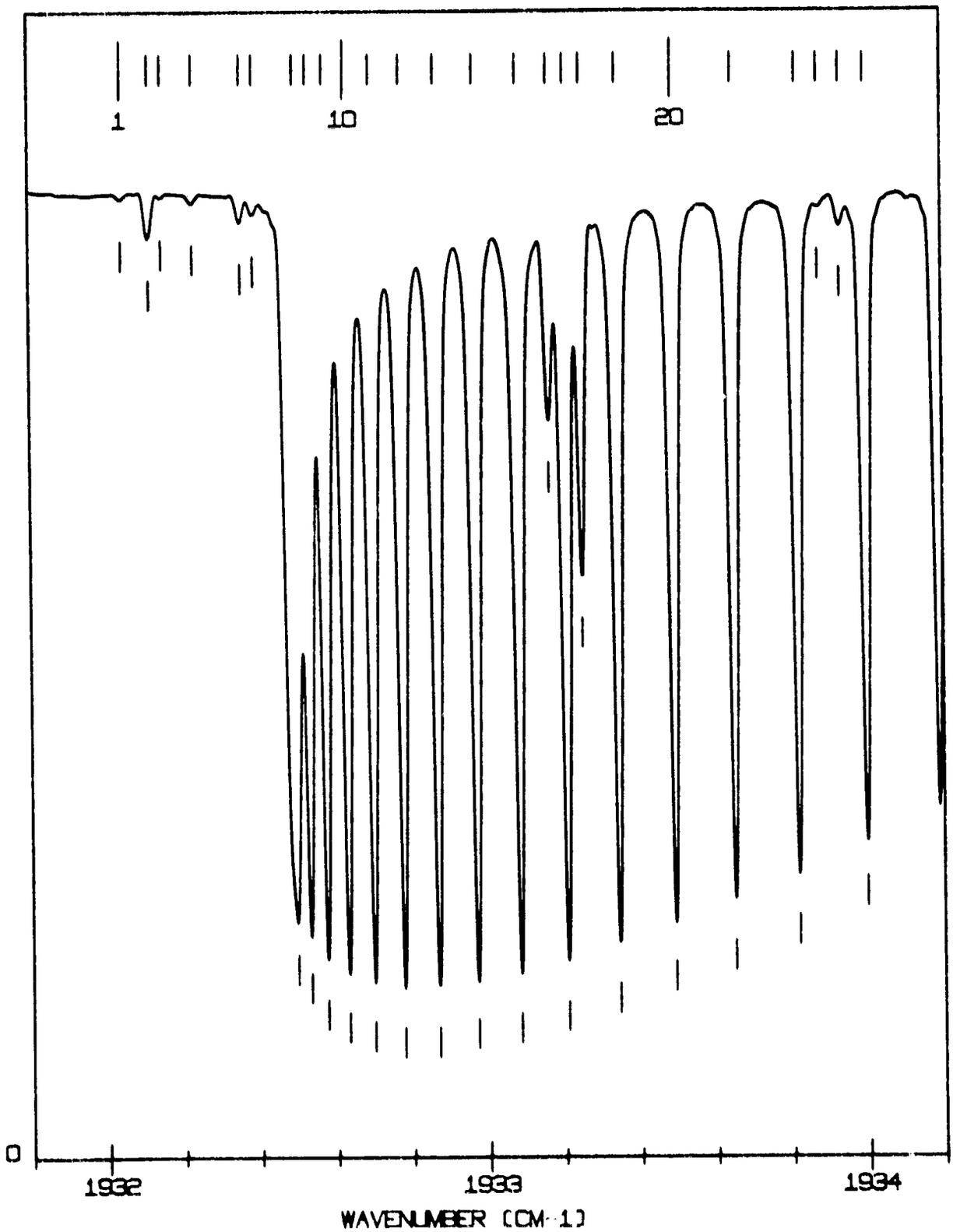


TABLE A53

Line Positions and Identifications (1934-1936 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1934.11415	1934.11459	13302-02201	626	R34
2	1934.18854	1934.18851	11102-00001	626	Q34
3	1934.38921	1934.38929	11102-00001	626	Q36
4	1934.60042	1934.60039	11102-00001	626	Q38
5	1934.72016	1934.72062	11102-00001	636	R46
6	1934.81997	1934.82166	11102-00001	626	Q40
		1934.81763	11102-00001	626	R2
7	1934.96487	1934.96452	13302-02201	626	R35
8	1935.05292	1935.05292	11102-00001	626	Q42
9	1935.18924	1935.18935	20003-01101	626	R67
10	1935.29403	1935.29399	11102-00001	626	Q44
11	1935.48453	1935.48328	12202-01101	626	R21
12	1935.50739	1935.50599	21102-10001	626	P20
13	1935.54457	1935.54470	11102-00001	626	Q46
14	1935.80491	1935.80484	11102-00001	626	Q48

FRAME A53

9.857 Torr 384 meters

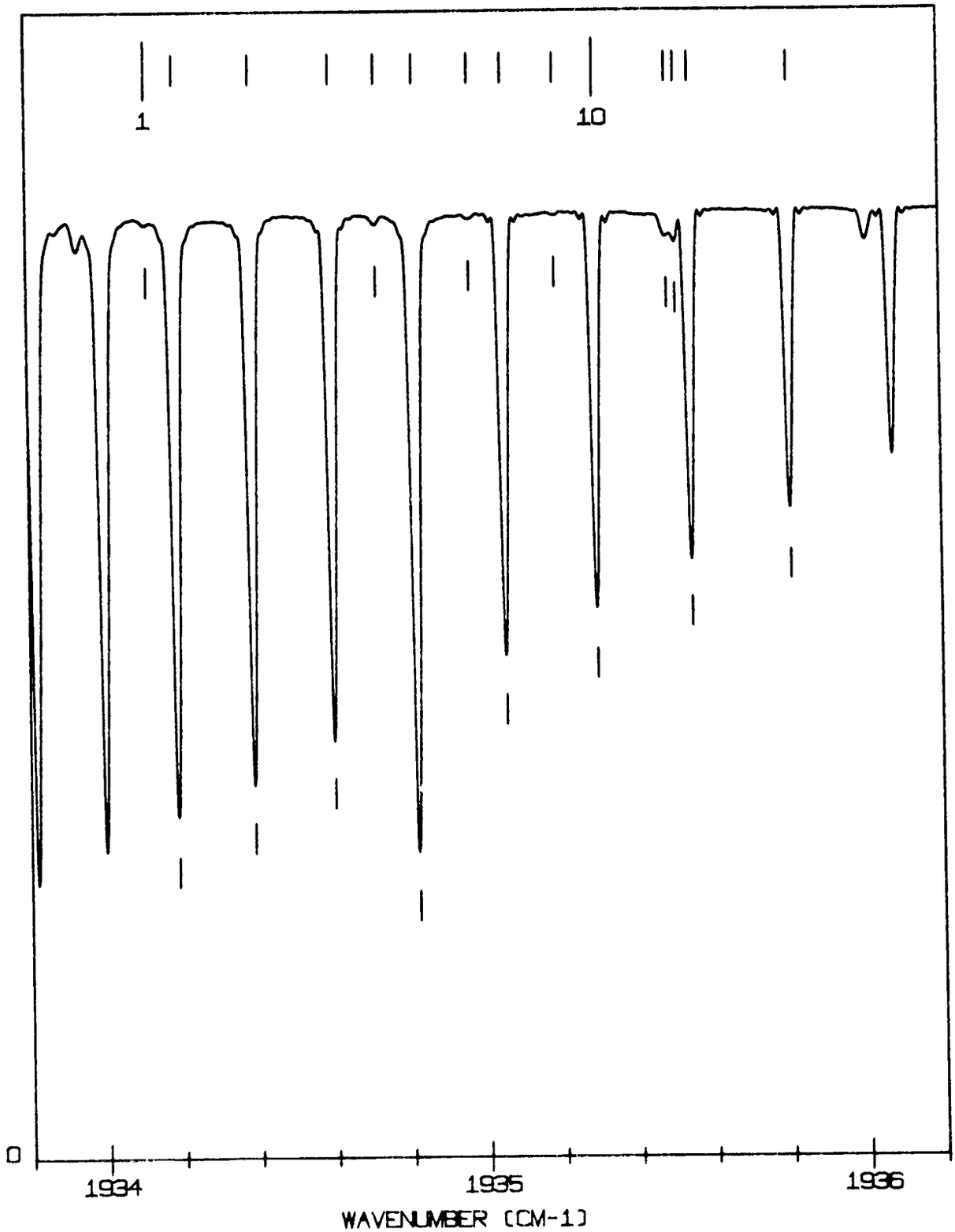


TABLE A54

Line Positions and Identifications (1936-1938 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1936.00826	1936.00811	12202-01101 626	R22
2	1936.07419	1936.07423	11102-00001 626	Q50
3	1936.22653		?	
4	1936.35306	1936.35265	11102-00001 626	Q52
5	1936.38796	1936.38791	11102-00001 626	R4
		1936.40043	11102-00001 636	R48
6	1936.63982	1936.63989	11102-00001 626	Q54
7	1936.93571	1936.93573	11102-00001 626	Q56
8	1937.01201		H2O	
9	1937.07800	1937.07820	21102-10001 626	P18
10	1937.16837	1937.16617	12202-01101 626	R23
			H2O	
11	1937.23959	1937.23995	11102-00001 626	Q58
			H2O	
12	1937.55218	1937.55231	11102-00001 626	Q60
13	1937.63708	1937.63668	12202-01101 626	R24
14	1937.74686		?	
15	1937.87253	1937.87259	11102-00001 626	Q62
16	1937.96197	1937.96231	11102-00001 626	R6
			H2O	

FRAME A54

9.857 Torr 384 meters

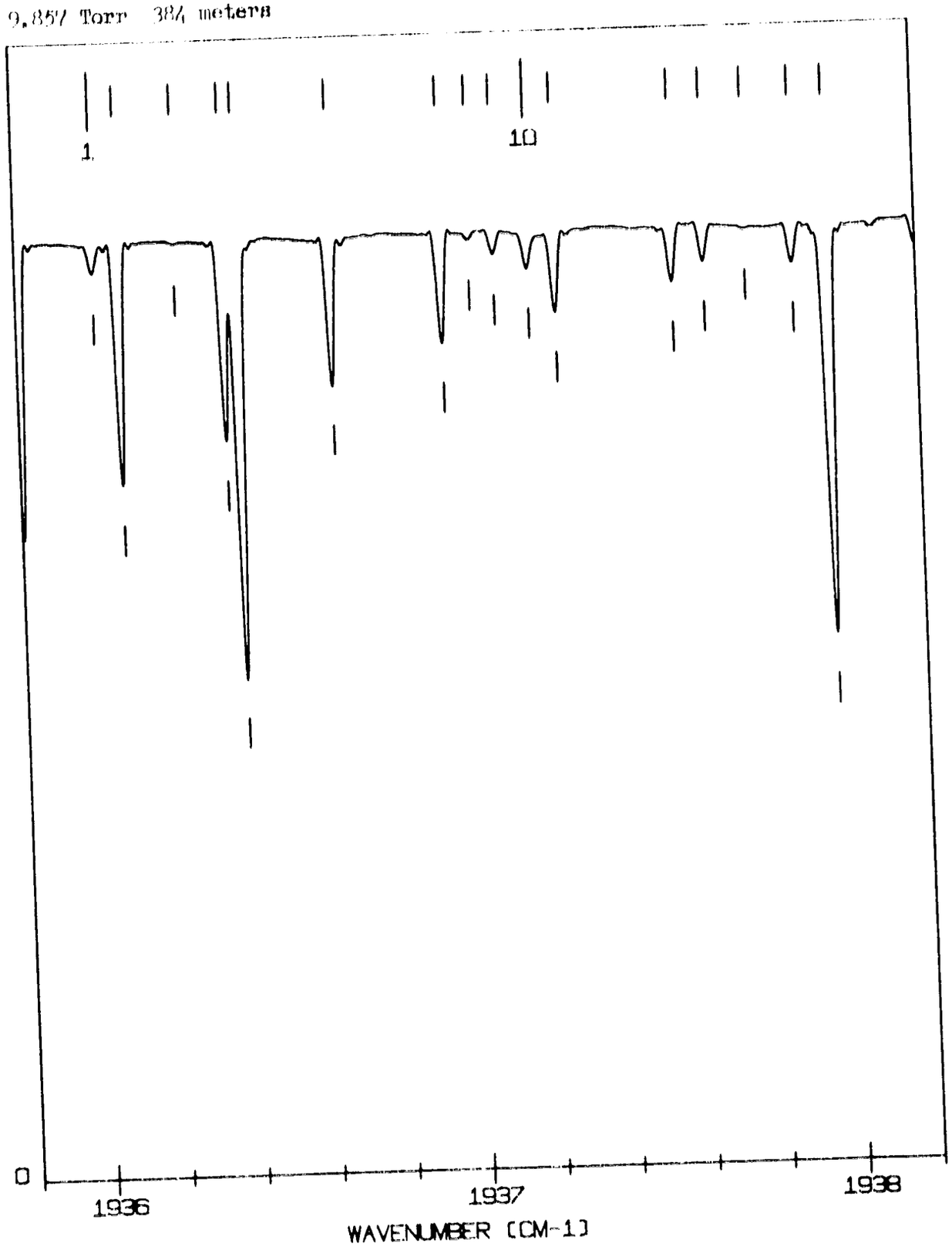


TABLE A55

Line Positions and Identifications (1938-1940 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1938.08286	1938.08354	11102-00001 636	R50
2	1938.20070	1938.20052	11102-00001 626	Q64
3	1938.38250	1938.38250	13302-02201 626	R39
4	1938.53597	1938.53588	11102-00001 626	Q66
5	1938.64879	1938.64904	21102-10001 626	P16
6	1938.69521		H2O	
7	1938.85929	1938.85902	12202-01101 626	R25
		1938.87841	11102-00001 626	Q68
8	1939.12482		H2O	
9	1939.23226	1939.22786	11102-00001 626	Q70
			SIDELOBE	
10	1939.26958	1939.26991	12202-01101 626	R26
11	1939.54077	1939.54079	11102-00001 626	R8
12	1939.77055	1939.76977	11102-00001 636	R52
13	1939.94647	1939.94649	11102-00001 626	Q74

FRAME A55

9.857 Torr 384 meters

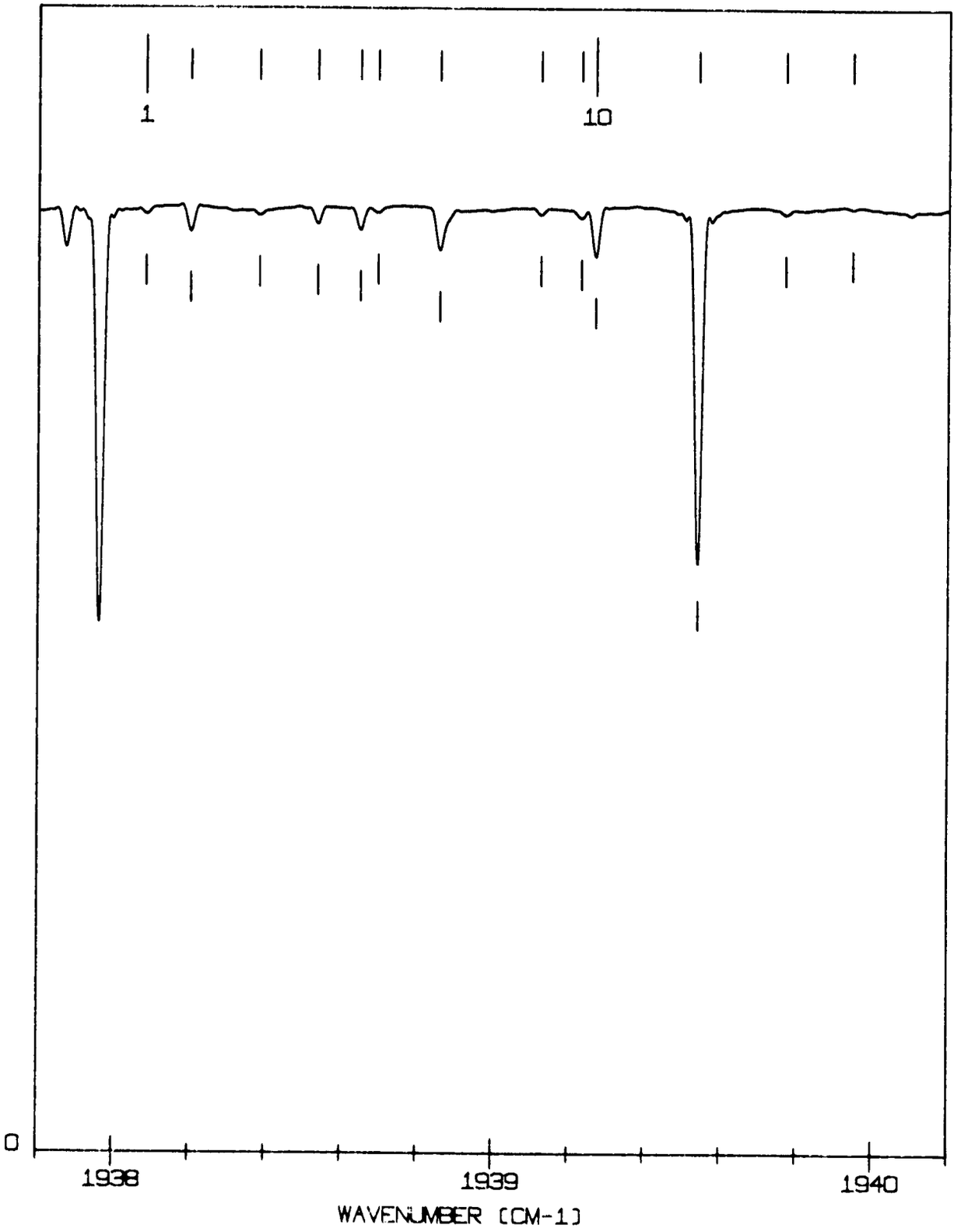


TABLE A56

Line Positions and Identifications (1940-1942 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1940.09940	1940.10125	13302-02201 626	R41
2	1940.21858	1940.21857	21102-10001 626	P14
3	1940.26723		H2O	
4	1940.50434		?	
5	1940.56165	1940.56176	12202-01101 626	R27
6	1940.90798	1940.90769	12202-01101 626	R28
7	1940.96280		?	
8	1941.12327	1941.12328	11102-00001 626	R10
9	1941.45961	1941.45894	11102-00001 636	R54
10	1941.62725		H2O	
11	1941.75704		H2O	
12	1941.78832	1941.78684	21102-10001 626	P12
13	1941.82941		H2O	
		1941.82636	13302-02201 626	R43

FRAME A56

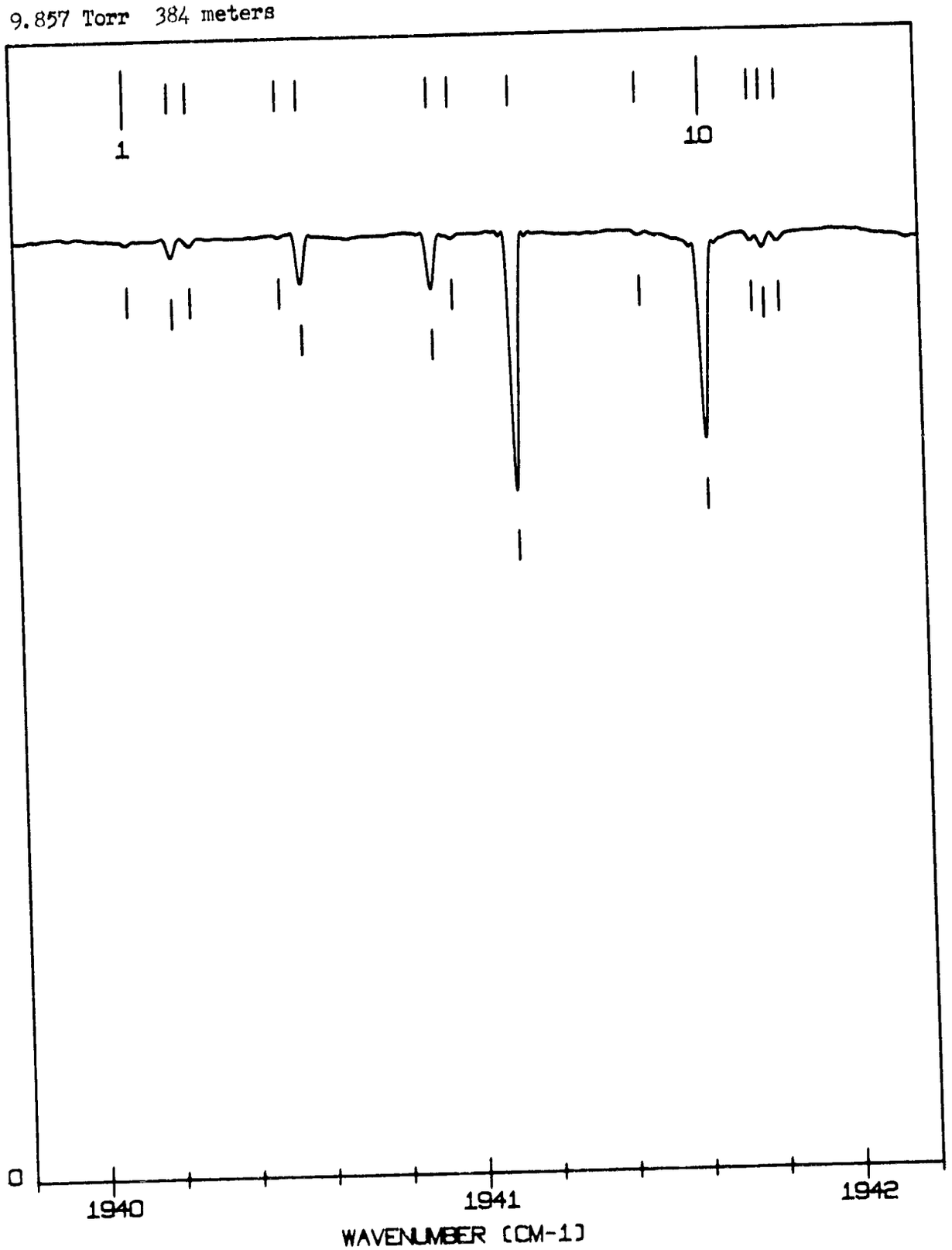


TABLE A57

Line Positions and Identifications (1942-1944 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1942.27492	1942.27434	12202-01101 626	R29
2	1942.51543		H2O	
		1942.54989	12202-01101 626	R30
3	1942.71117	1942.70974	11102-00001 626	R12
4	1942.76482		H2O	
5	1943.15123	1943.15084	11102-00001 636	R56
6	1943.35354	1943.35386	21102-10001 626	P10
7	1943.55805	1943.55769	13302-02201 626	R45
8	1943.99661	1943.99668	12202-01101 626	R31

FRAME A57

9.857 Torr 384 meters

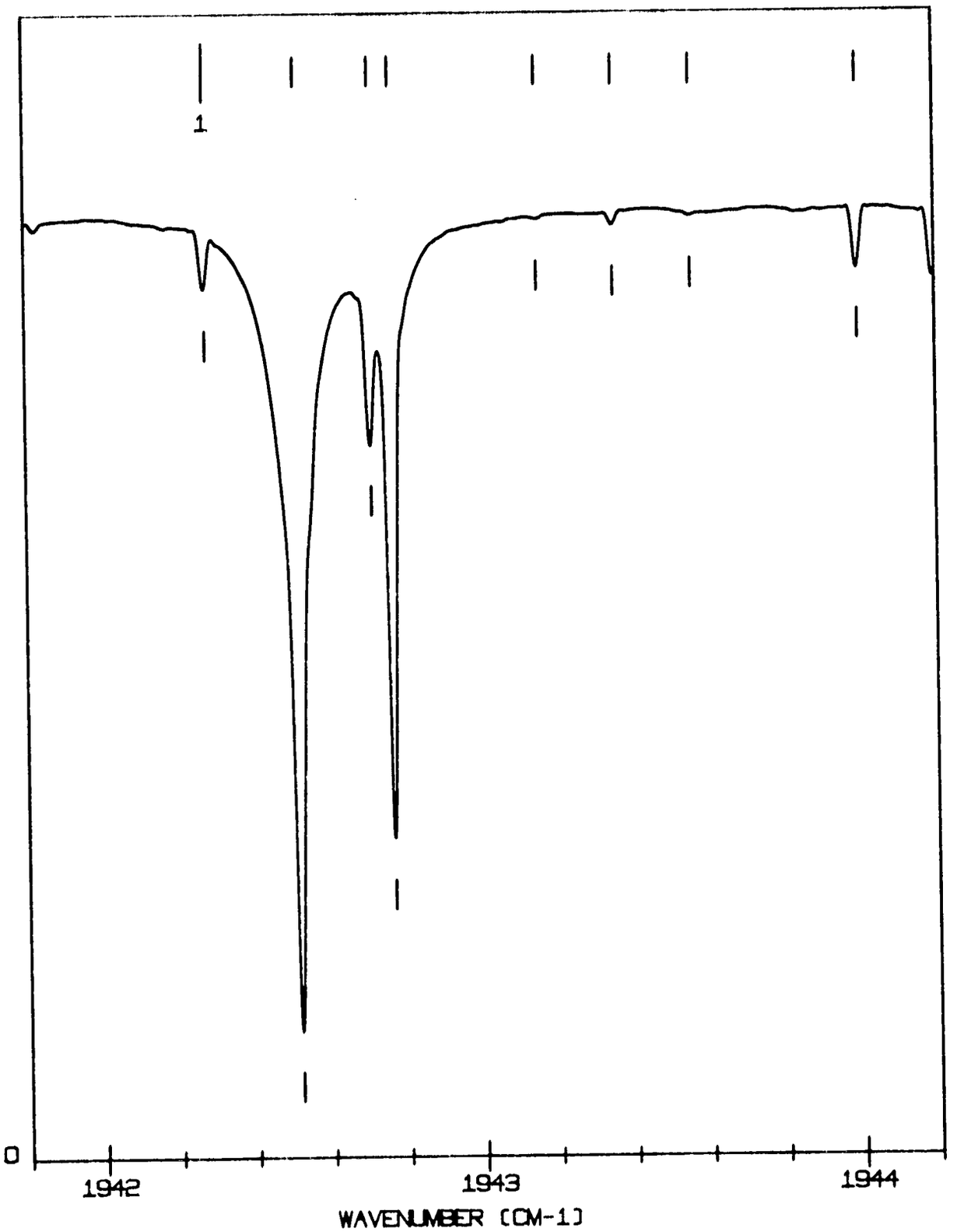


TABLE A58

Line Positions and Identifications (1944-1946 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1944.19631	1944.19639	12202-01101 626	R32
2	1944.29992	1944.30011	11102-00001 626	R14
3	1944.91982	1944.91968	21102-10001 626	P8
4	1945.34003		H2O	
5	1945.47257		H2O	
6	1945.72861	1945.72871	12202-01101 626	R33
7	1945.84745	1945.84708	12202-01101 626	R34

FRAME A58

9.857 Torr 384 meters

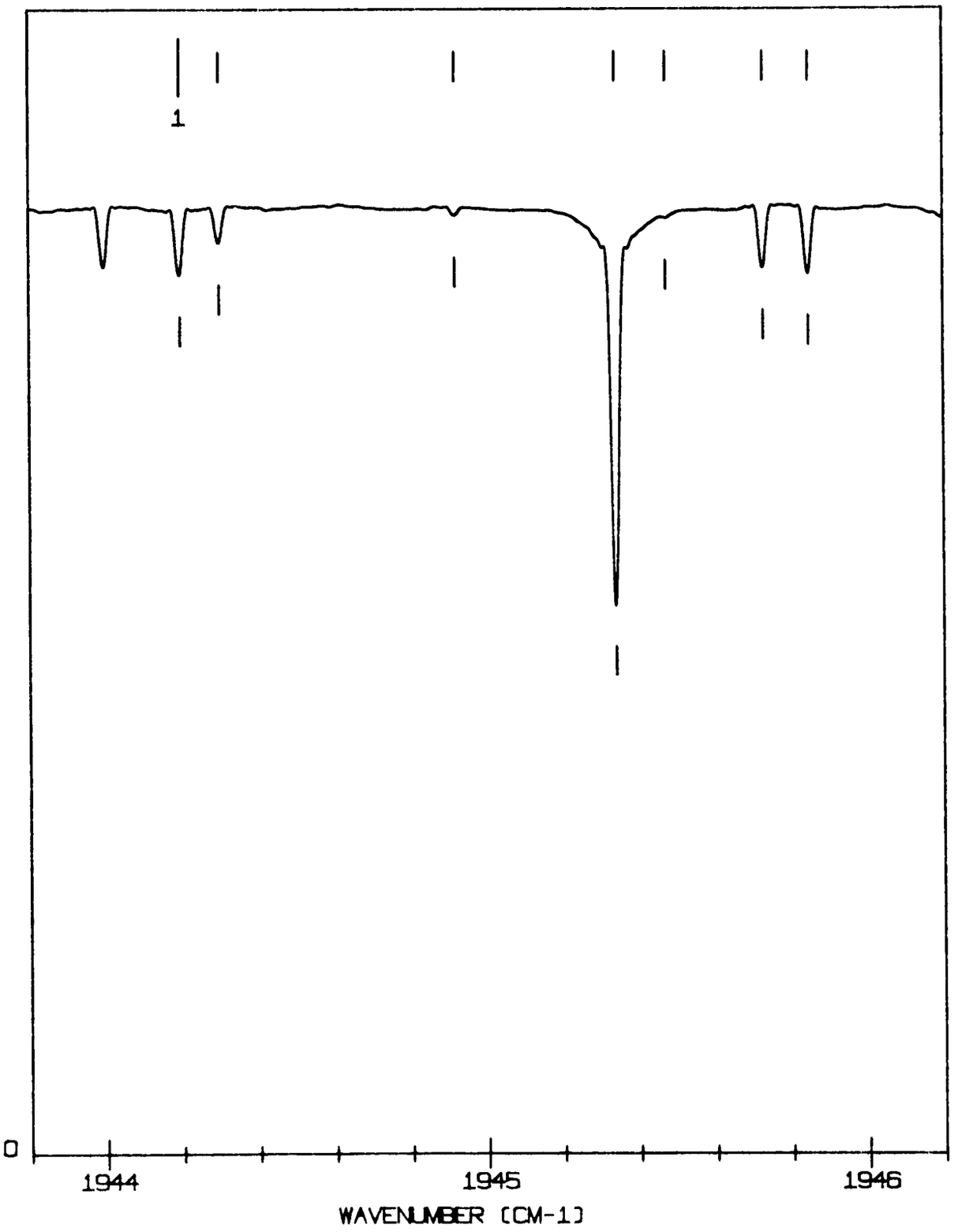


TABLE A59

Line Positions and Identifications (1946-1948 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1946.20022		H2O		
2	1946.36423		H2O		
3	1946.48313	1946.48430	21102-10001	626	P6
4	1947.47107	1947.47035	12202-01101	626	R35
5	1947.49708	1947.49225	11102-00001	626	R18
		1947.50180	12202-01101	626	R36

FRAME A59

0.854 Torr 84 meters

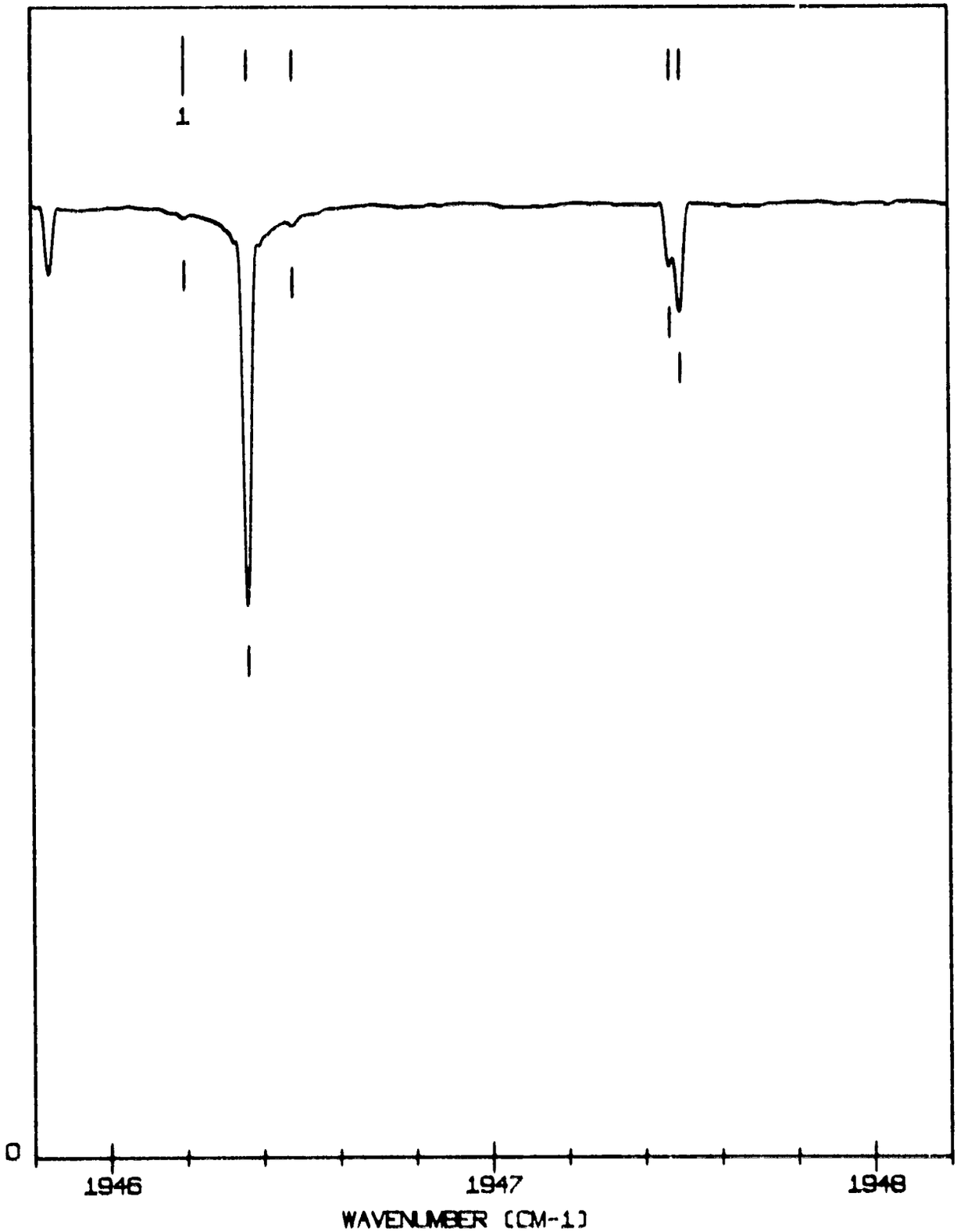


TABLE A60

Line Positions and Identifications (1948-1950 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1948.04455	1948.04772	21102-10001 626	P4
2	1949.09396	1949.09387	11102-00001 626	R20
3	1949.16018	1949.16041	12202-01101 626	R38
4	1949.22127	1949.22151	12202-01101 626	R37
5	1949.24968		H2O	

FRAME A60

9.857 Torr 384 meters

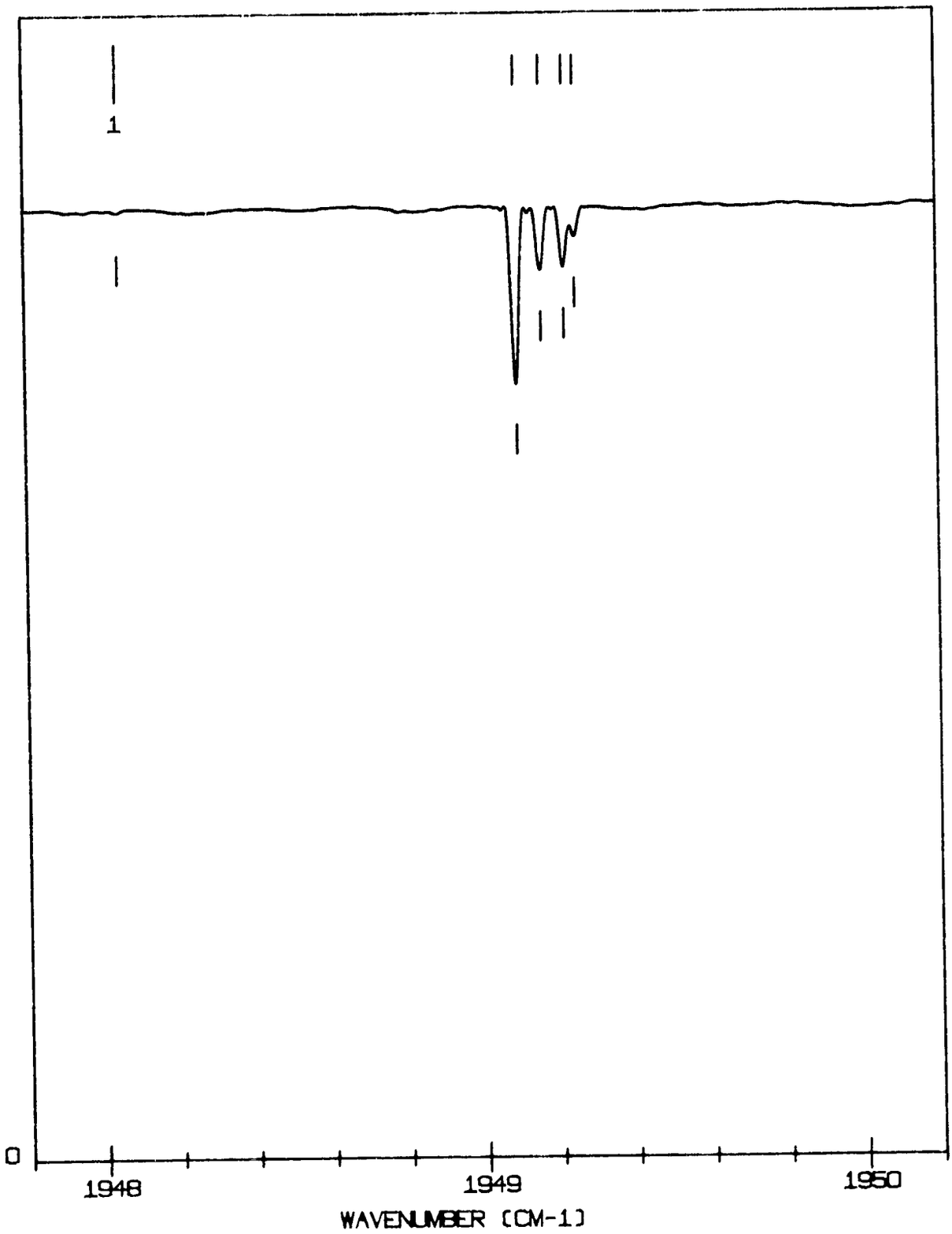


TABLE A61

Line Positions and Identifications (1950-1952 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1950.69902	1950.69907	11102-00001 626	R22
2	1950.82280	1950.82278	12202-01101 626	R40
3	1950.90206	1950.98210	12202-01101 626	R39
4	1951.12941		H2O	
5	1951.18520	1951.17663	21102-10001 626	Q2
		1951.19050	21102-10001 626	Q4
6	1951.20981	1951.21227	21102-10001 626	Q6
7	1951.24221	1951.24189	21102-10001 626	Q8
8	1951.27939	1951.27932	21102-10001 626	Q10
9	1951.32479	1951.32449	21102-10001 626	Q12
10	1951.37797	1951.37734	21102-10001 626	Q14
11	1951.43737	1951.43779	21102-10001 626	Q16
12	1951.50532	1951.50576	21102-10001 626	Q18
13	1951.58094	1951.58117	21102-10001 626	Q20
14	1951.66501	1951.66395	21102-10001 626	Q22
15	1951.75408	1951.75401	21102-10001 626	Q24
16	1951.85125	1951.85128	21102-10001 626	Q26
17	1951.95605	1951.95567	21102-10001 626	Q28

FRAME A61

0.867 Torr 84 meters

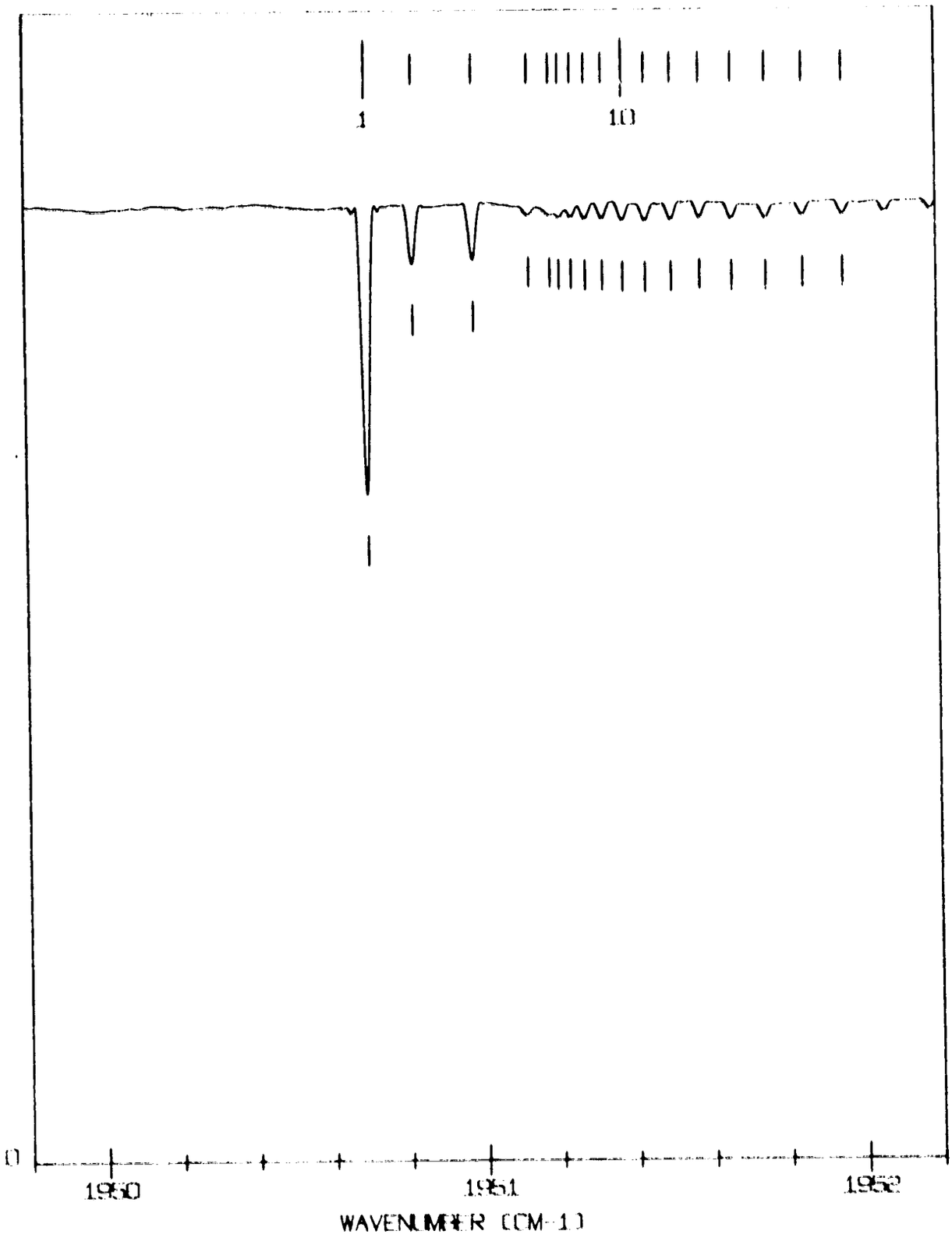


TABLE A62

Line Positions and Identifications (1952-1954 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1952.06643	1952.06709	21102-10001 626	Q30
2	1952.18563	1952.18545	21102-10001 626	Q32
3	1952.30784	1952.30770	11102-00001 626	R24
		1952.31061	21102-10001 626	Q34
4	1952.44039	1952.44242	21102-10001 626	Q36
5	1952.48862	1952.48874	12202-01101 626	R42
6	1952.58075	1952.58065	21102-10001 626	Q38
7	1952.75212	1952.75202	12202-01101 626	R41
		1952.72503	21102-10001 626	Q40
8	1952.87491	1952.87516	21102-10001 626	Q42
9	1953.02907	1953.03051	21102-10001 626	Q44
10	1953.18898	1953.19039	21102-10001 626	Q46
11	1953.35536	1953.35389	21102-10001 626	Q48
12	1953.51001	1953.51982	21102-10001 626	Q50
		1953.51016	21102-10001 626	R22
13	1953.73988		?	
14	1953.77528		?	
15	1953.91979	1953.91985	11102-00001 626	R26

FRAME A62

9.857 Torr 384 meters

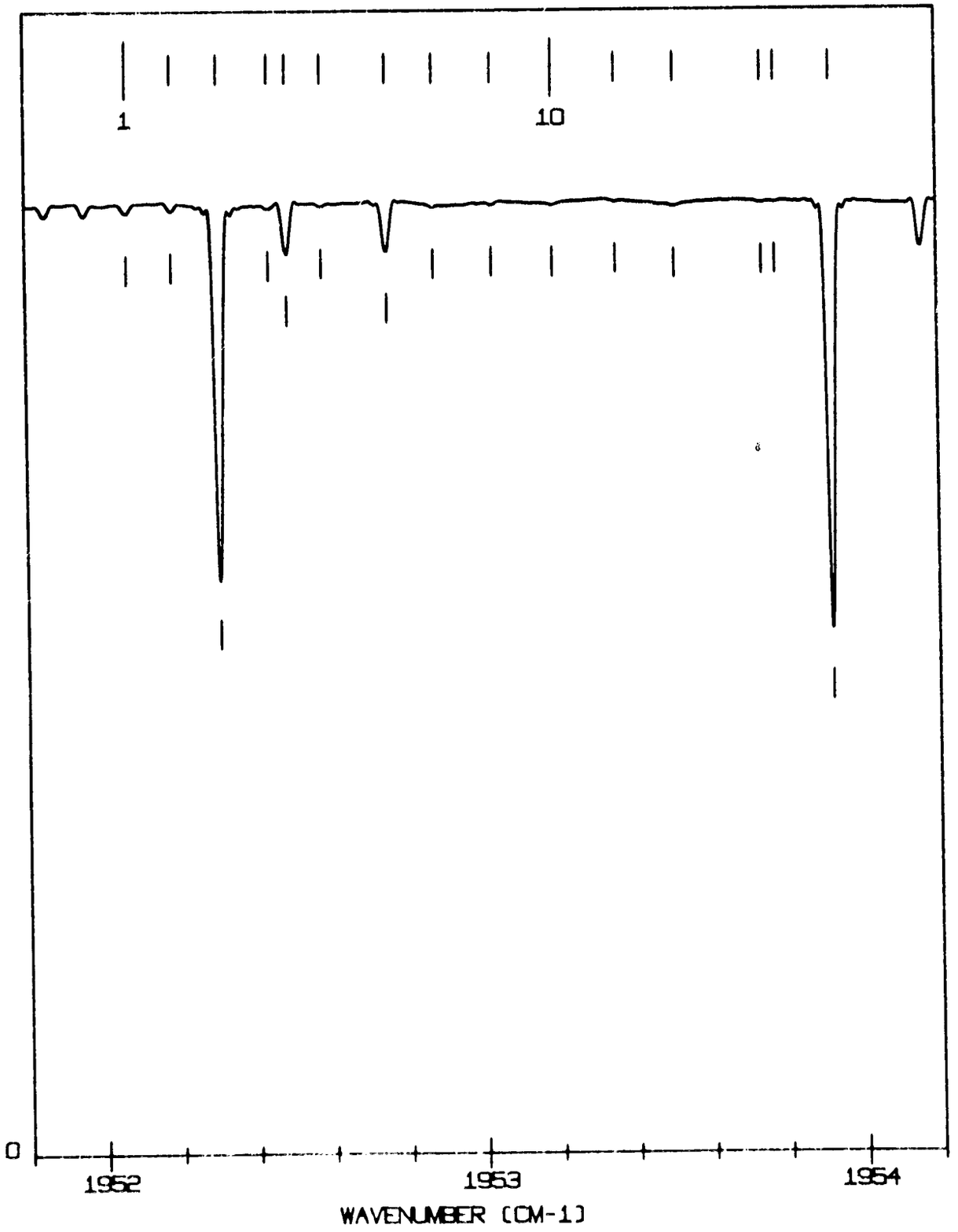


TABLE A63

Line Positions and Identifications (1954-1956 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1954.15813	1954.15813	12202-01101 626	R44
2	1954.40584		H2O	
3	1954.53139	1954.53116	12202-01101 626	R43
4	1954.99593		H2O	
5	1955.24851		H2O	
6	1955.53522	1955.53521	11102-00001 626	R28
7	1955.73435		H2O	
8	1955.83088	1955.83078	12202-01101 626	R46

FRAME A63

9.857 Torr 384 meters

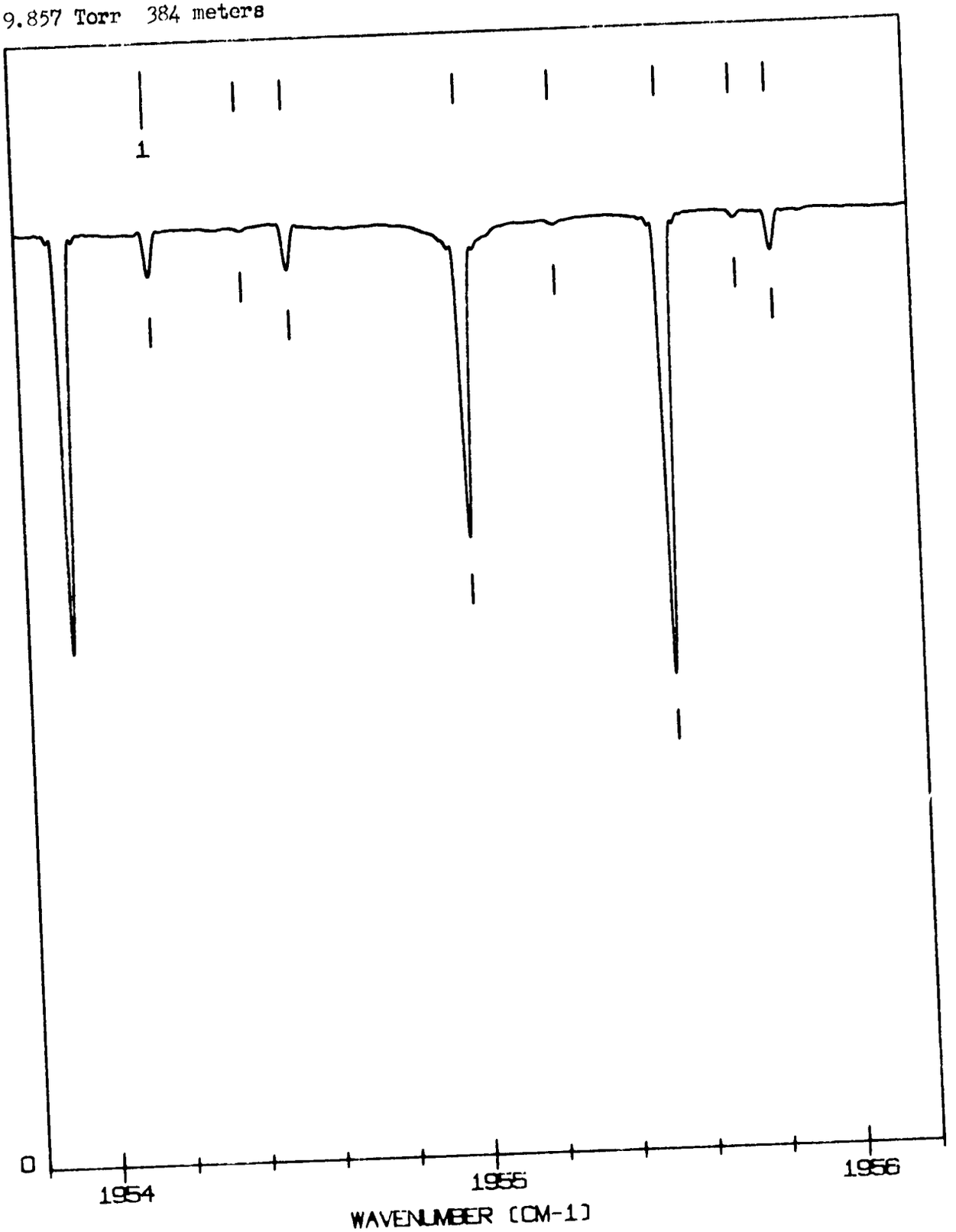


TABLE A64

Line Positions and Identifications (1956-1958 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1956.23324		H2O	
2	1956.31979	1956.31939	12202-01101 626	R45
3	1956.62708	1956.62456	21102-10001 626	R6
4	1957.02891		H2O	
5	1957.15376	1957.15376	11102-00001 626	R30
6	1957.50658	1957.50653	12202-01101 626	R48
7	1957.65535		H2O	
8	1957.69640	1957.69959	20002-01101 626	P55
9	1957.89736	1957.89749	20002-01101 636	P47

FRAME A64 ORIGINAL PAGE IS OF POOR QUALITY

9.857 Torr 384 meters

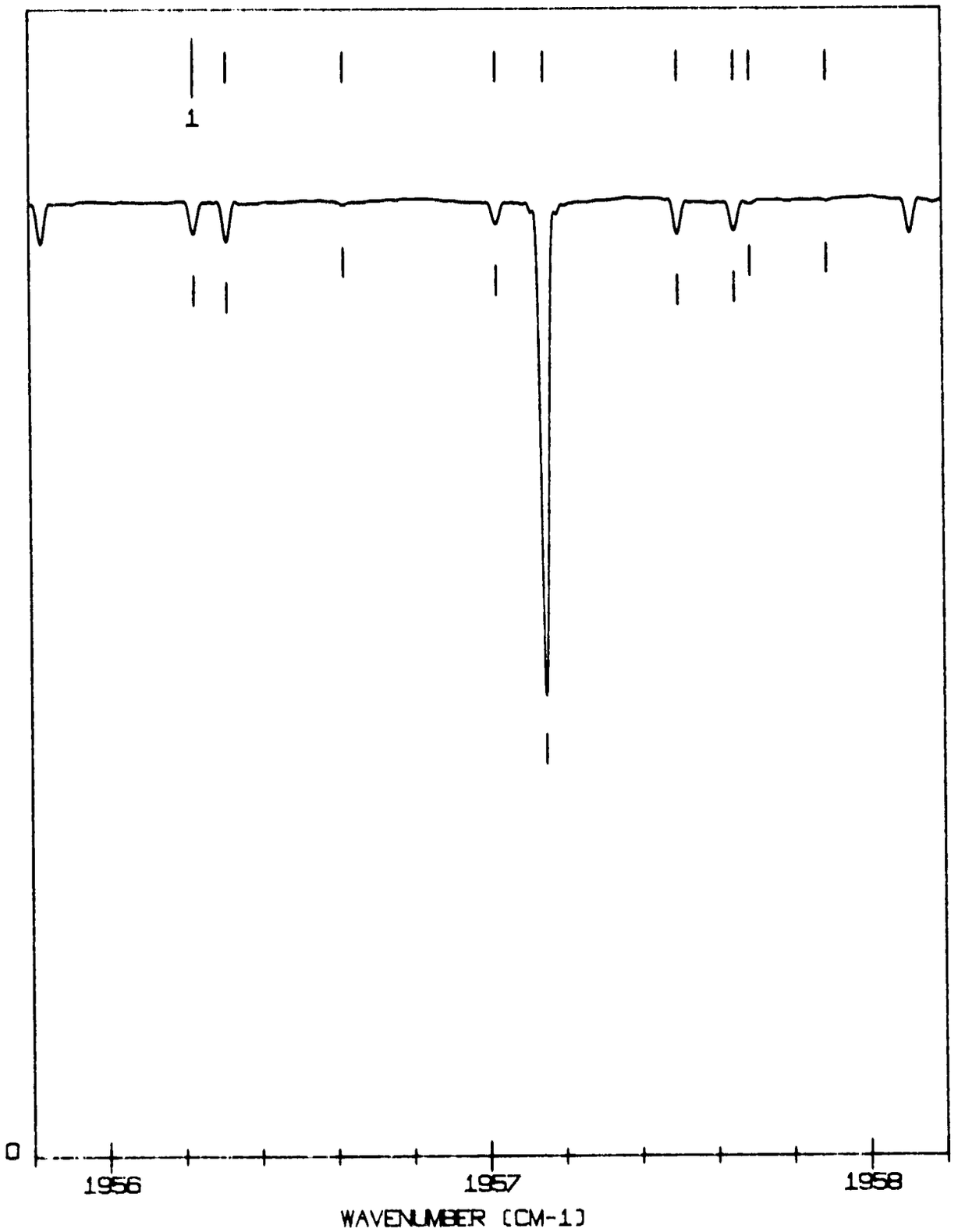


TABLE A65

Line Positions and Identifications (1958-1960 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1958.11665	1958.11660	12202-01101 626	R47
2	1958.17870	1958.17971	21102-10001 626	R8
3	1958.77533	1958.77535	11102-00001 626	R32
4	1959.18517	1959.18518	12202-01101 626	R50
5	1959.48226	1959.48055	20002-01101 626	P53
6	1959.63104		H2O	
		1959.62828	20002-01101 636	P45
7	1959.73493	1959.73340	21102-10001 626	R10
8	1959.92261	1959.92265	12202-01101 626	R49

FRAME A65

9.857 Torr 384 meters

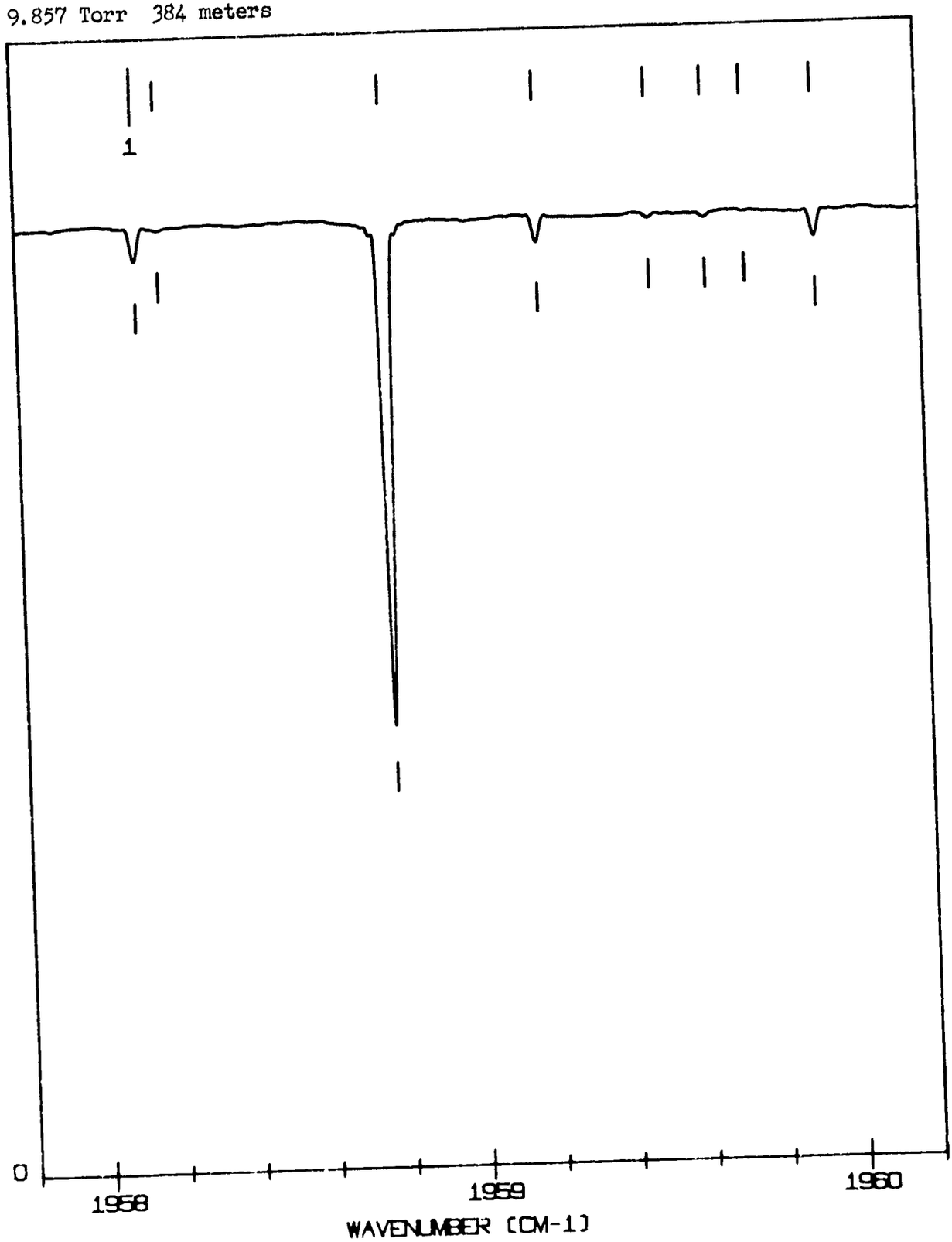


TABLE A66

Line Positions and Identifications (1960-1962 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1960.39988	1960.39988	11102-00001 626	R34
2	1960.86646	1960.86656	12202-01101 626	R52
3	1961.18151		H2O	
4	1961.25264	1961.25393	20002-01101 626	P51
5	1961.35161	1961.35129	20002-01101 636	P43
6	1961.73729	1961.73738	12202-01101 626	R51
7	1961.92989		H2O	

FRAME A66

9.857 Torr 384 meters

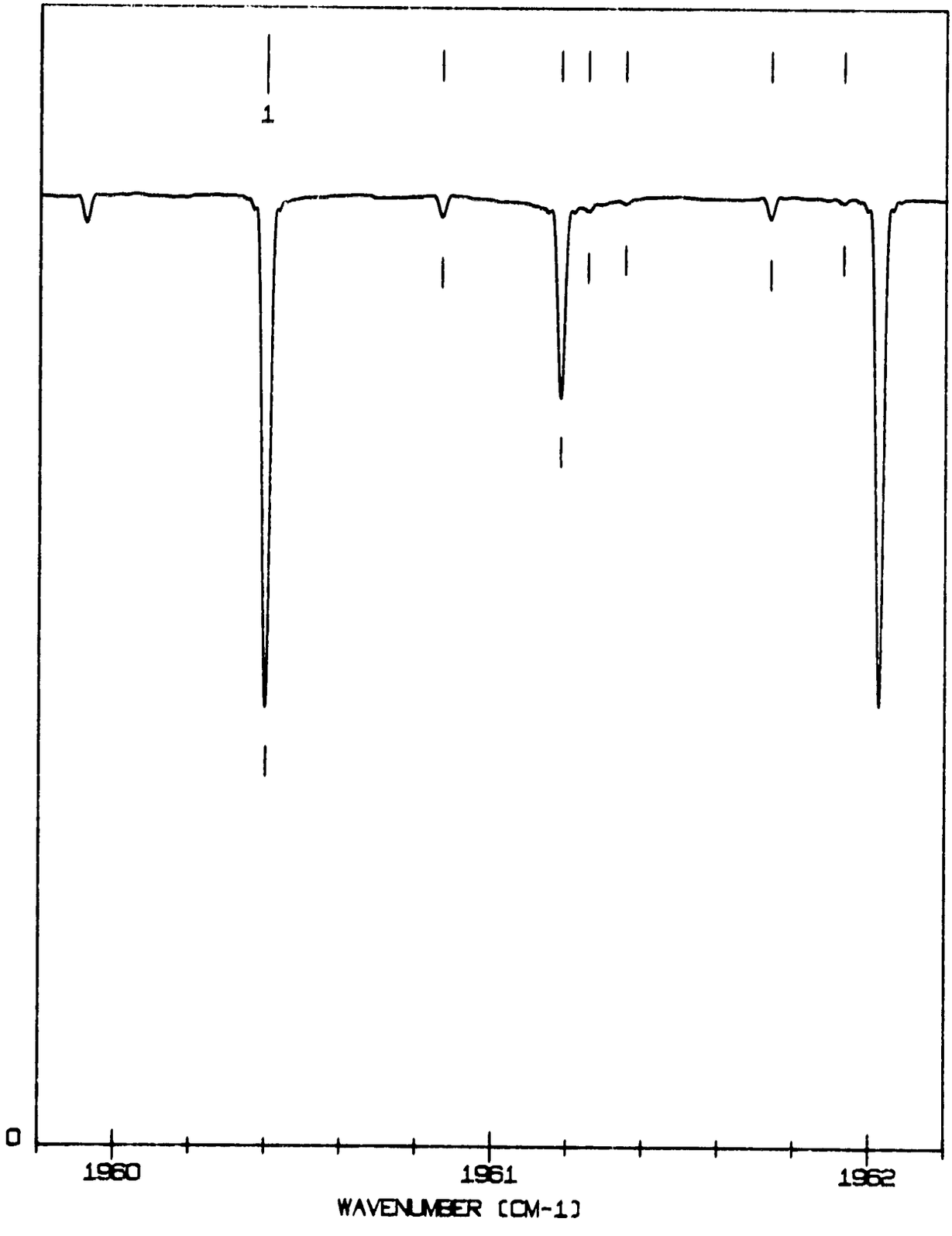


TABLE A67

Line Positions and Identifications (1962-1964 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1962.02720	1962.02721	11102-00001 626	R36
2	1962.55031	1962.55046	12202-01101 626	R54
3	1963.01997	1963.01966	20002-01101 626	P49
4	1963.06719	1963.06656	20002-01101 636	P41
5	1963.56087	1963.56064	12202-01101 626	R53
6	1963.65724	1963.65722	11102-00001 626	R38

FRAME A67

9.857 Torr 384 meters

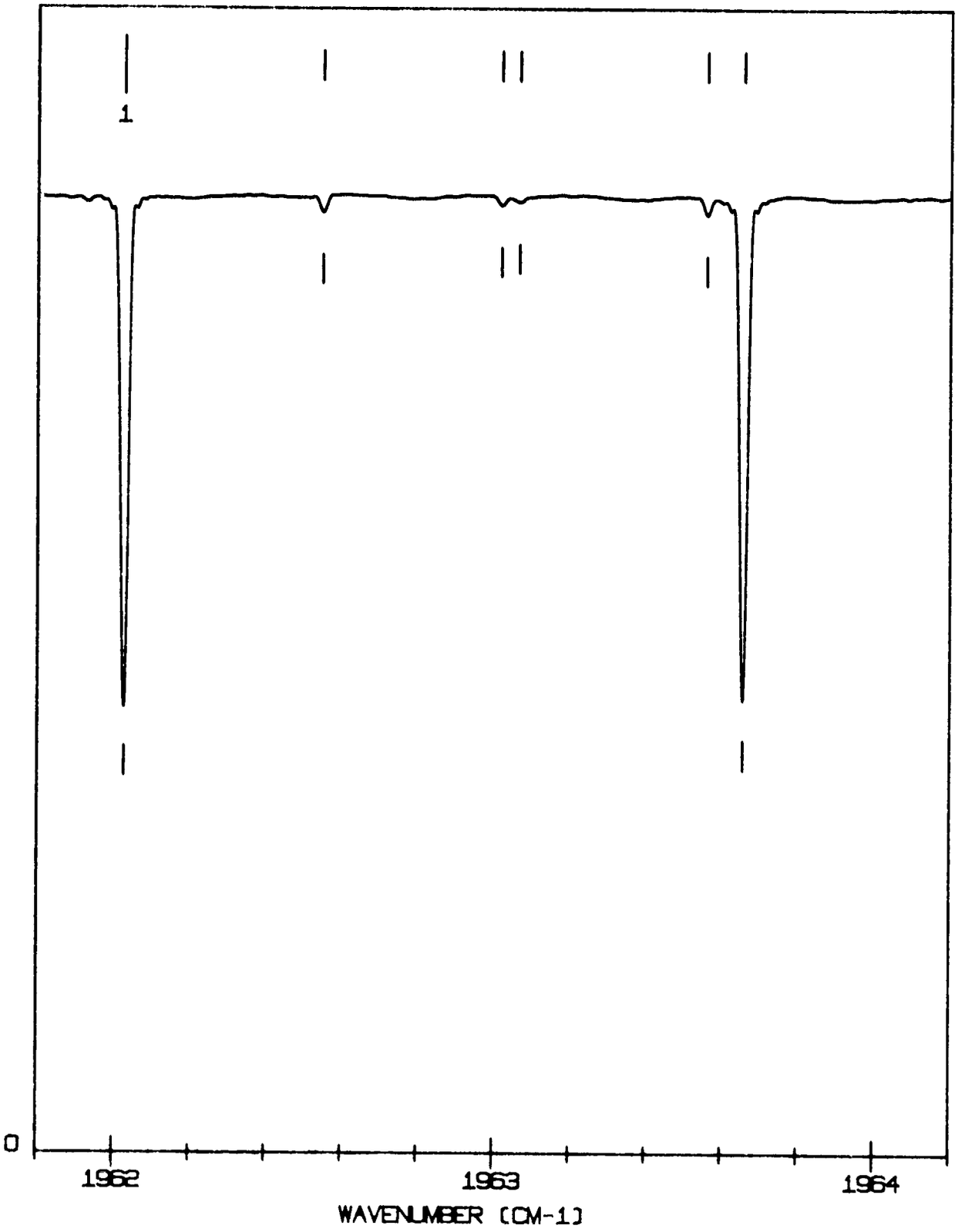


TABLE A68

Line Positions and Identifications (1964-1966 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1964.23636	1964.23669	12202-01101 626	R56
2	1964.77736	1964.77770	20002-01101 626	P47
		1964.77412	20002-01101 636	P39
3	1965.14260		?	
4	1965.28971	1965.28975	11102-00001 626	R40
5	1965.39187	1965.39225	12202-01101 626	R55
6	1965.92531	1965.92505	12202-01101 626	R59

FRAME A68

0.857 Torr 384 meters

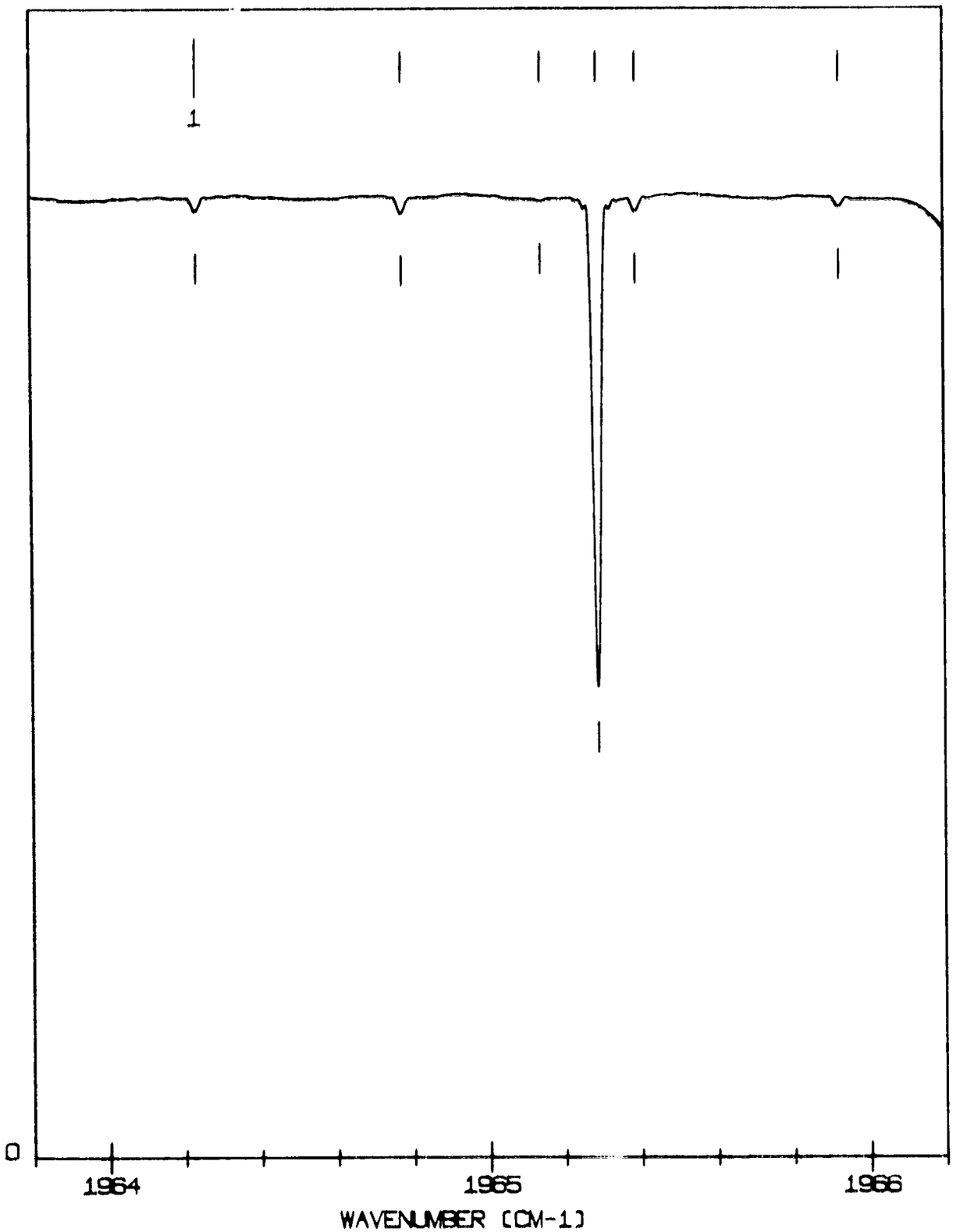


TABLE A69

Line Positions and Identifications (1966-1968 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1966.26094		H2O	
2	1966.47335	1966.47398	20002-01101 636	P37
3	1966.52795	1966.52798	20002-01101 626	P45
4	1966.92467	1966.92467	11102-00001 626	R42
5	1967.23403	1967.23203	12202-01101 626	R57
6	1967.44187		H2O	
7	1967.61315	1967.61532	12202-01101 626	R60

FRAME A69

9.857 Torr 384 meters

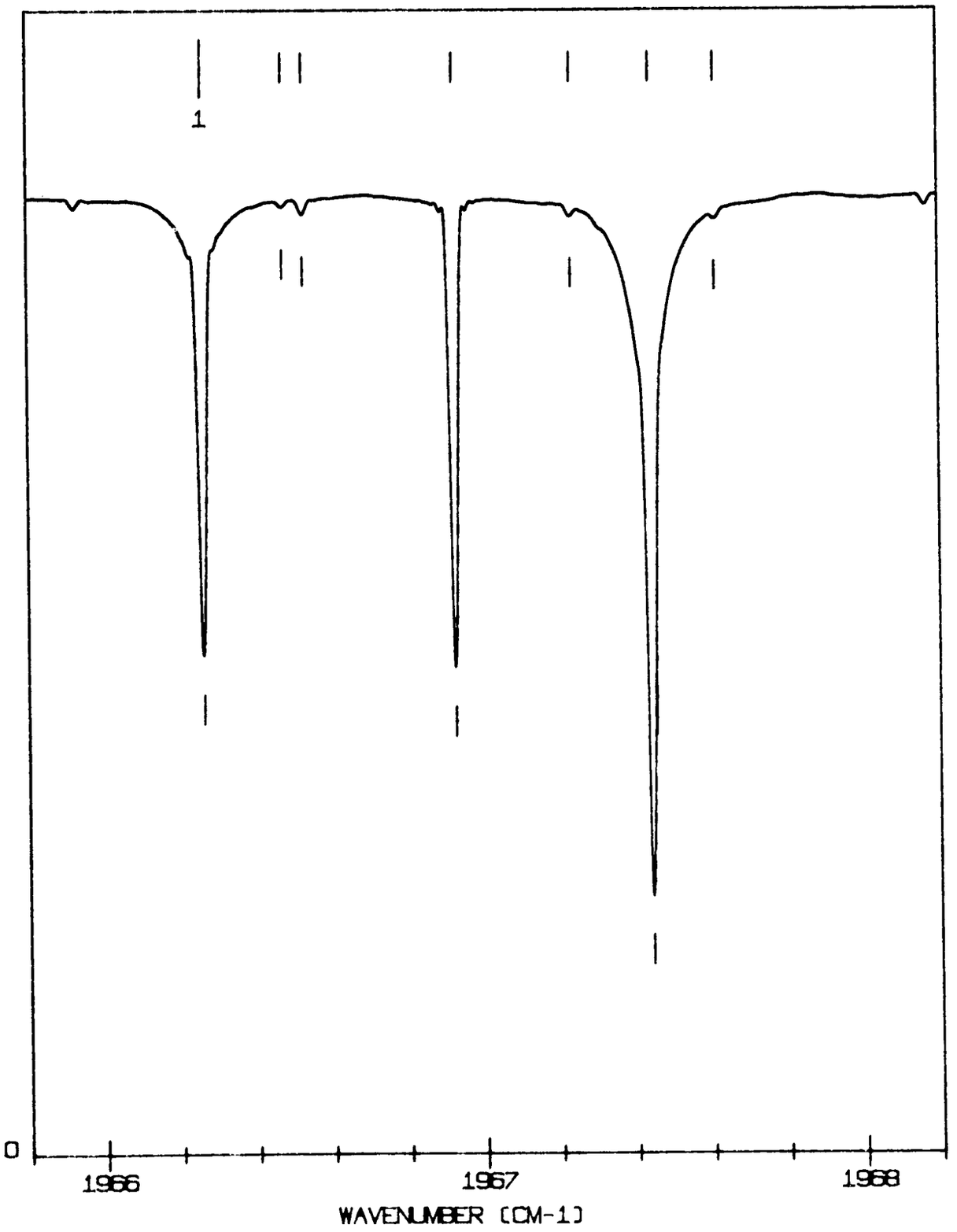


TABLE A70

Line Positions and Identifications (1968-1970 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1968.16897	1968.16620	20002-01101 636	P35
			H2O	
2	1968.27031	1968.27047	20002-01101 626	P43
3	1968.41517		?	
4	1968.56184	1968.56183	11102-00001 626	R44
5	1969.08123	1969.07979	12202-01101 626	R59
6	1969.30720	1969.30729	12202-01101 626	R62
7	1969.54201		?	
8	1969.85129	1969.85079	20002-01101 636	P33

FRAME A70

9.857 Torr 384 meters

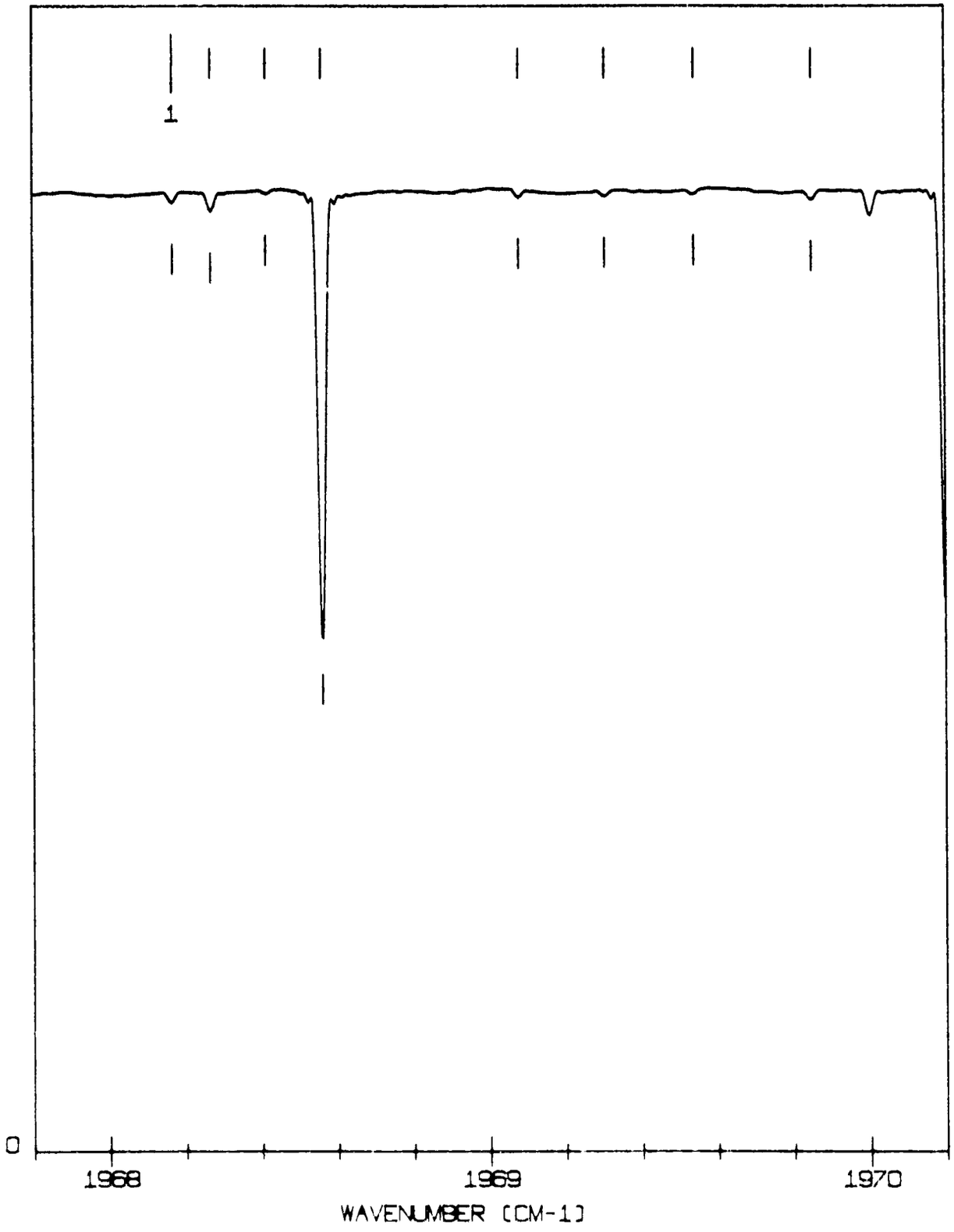


TABLE A71

Line Positions and Identifications (1970-1972 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1970.00486	1970.00510	20002-01101 626	P41
2	1970.20109	1970.20107	11102-00001 626	R46
3	1970.67926		?	
4	1970.93426	1970.93529	12202-01101 626	R61
5	1970.99938	1971.00072	12202-01101 626	R64
6	1971.52765	1971.52780	20002-01101 636	P31
7	1971.73133	1971.73182	20002-01101 626	P39
8	1971.84225	1971.84223	11102-00001 626	R48

FRAME A71

0.897 Torr 884 meters

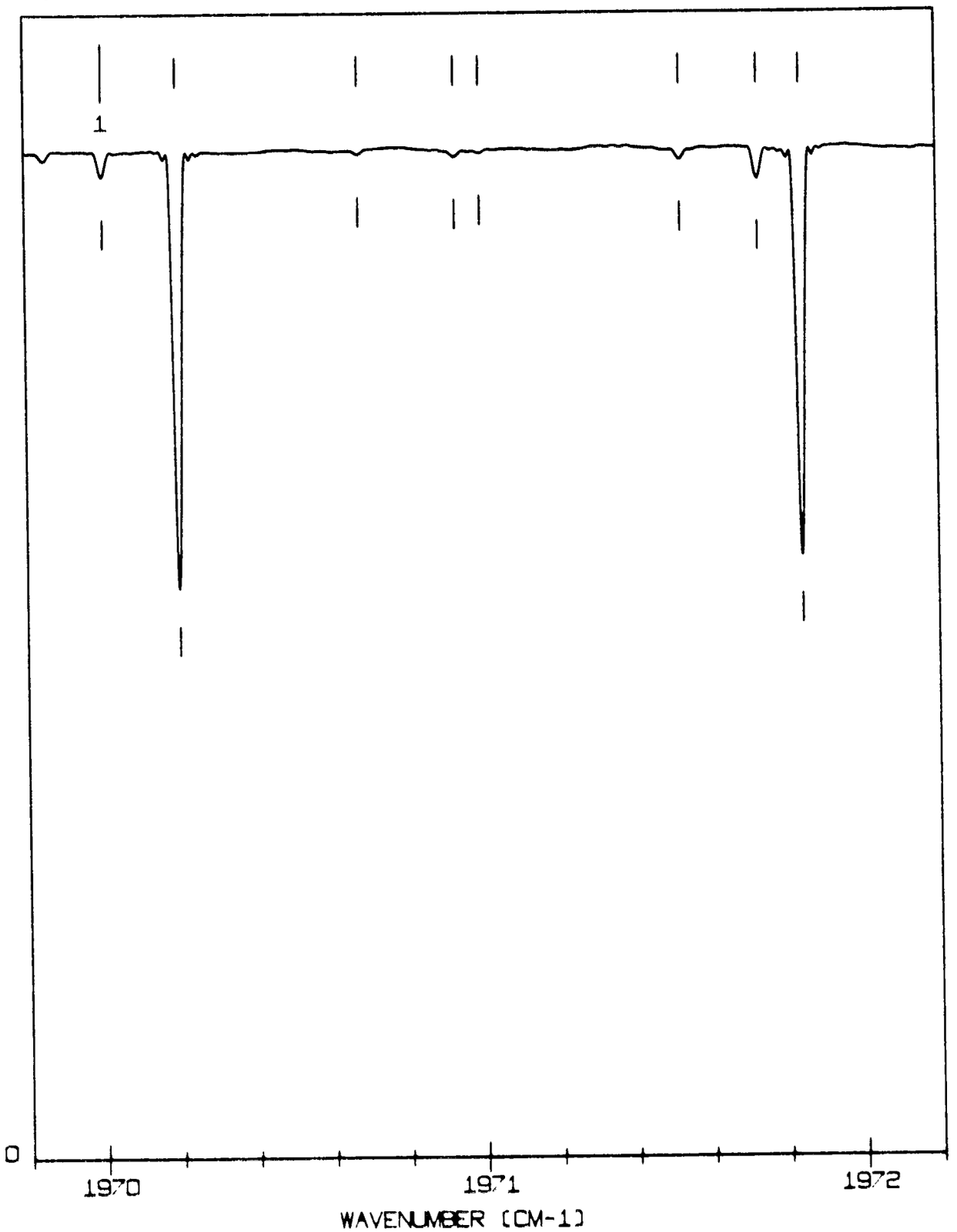


TABLE A72

Line Positions and Identifications (1972-1974 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1972.69925	1972.69538	12202-01101 626	R66
2	1972.79906	1972.79832	12202-01101 626	R63
3	1973.01139		?	
4	1973.19725	1973.19726	20002-01101 636	P29
5	1973.45047	1973.45059	20002-01101 626	P37
6	1973.48516	1973.48516	11102-00001 626	R50

FRAME A72

9.857 Torr 384 meters

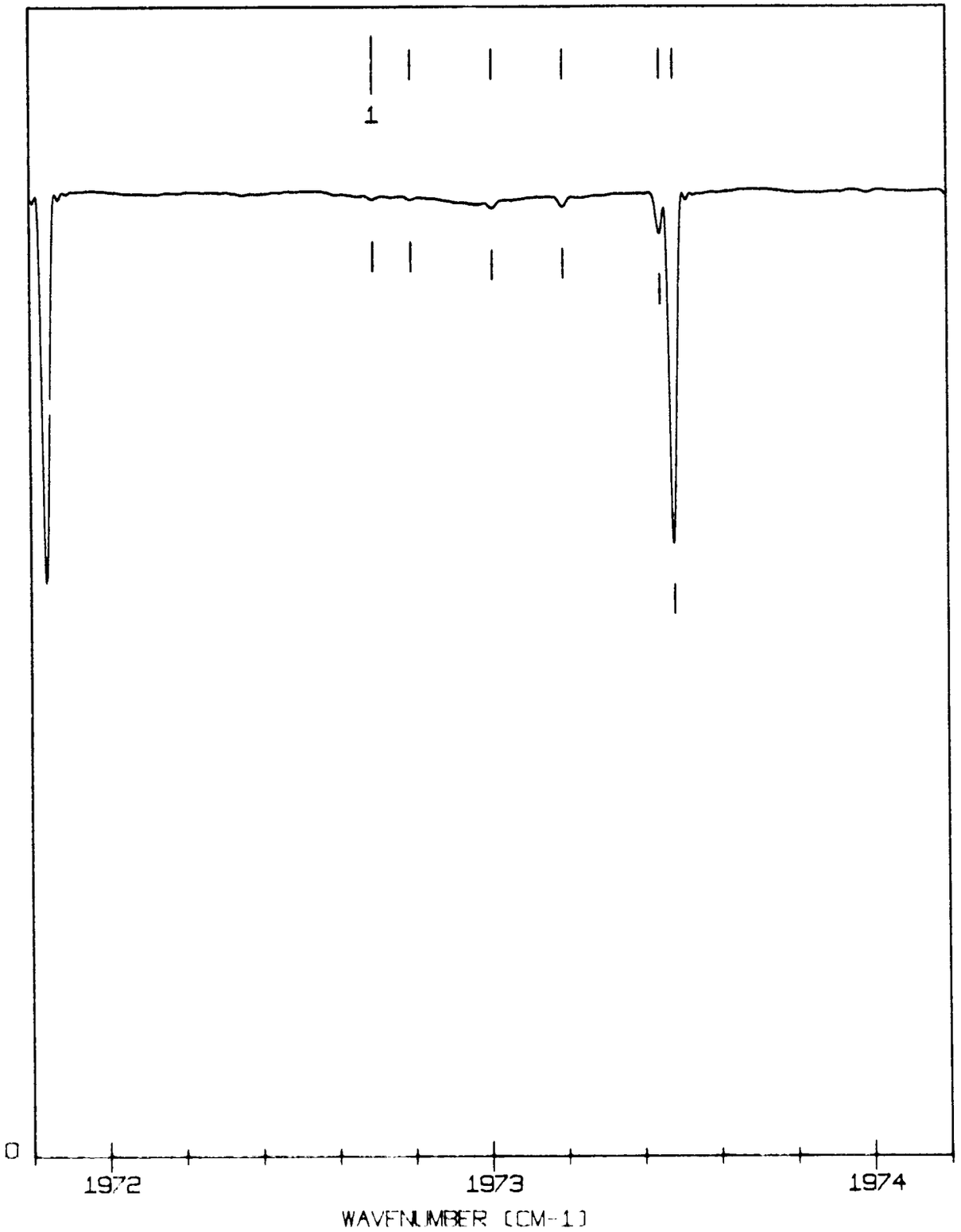


TABLE A73

Line Positions and Identifications (1974-1976 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1974.20423		?	
2	1974.67049	1974.66862	12202-01101 626	R65
3	1974.85907	1974.85922	20002-01101 636	P27
4	1975.12968	1975.12966	11102-00001 626	R52
5	1975.16235	1975.16136	20002-01101 626	P35
6	1975.41418		?	

FRAME A73

9.857 Torr 384 meters

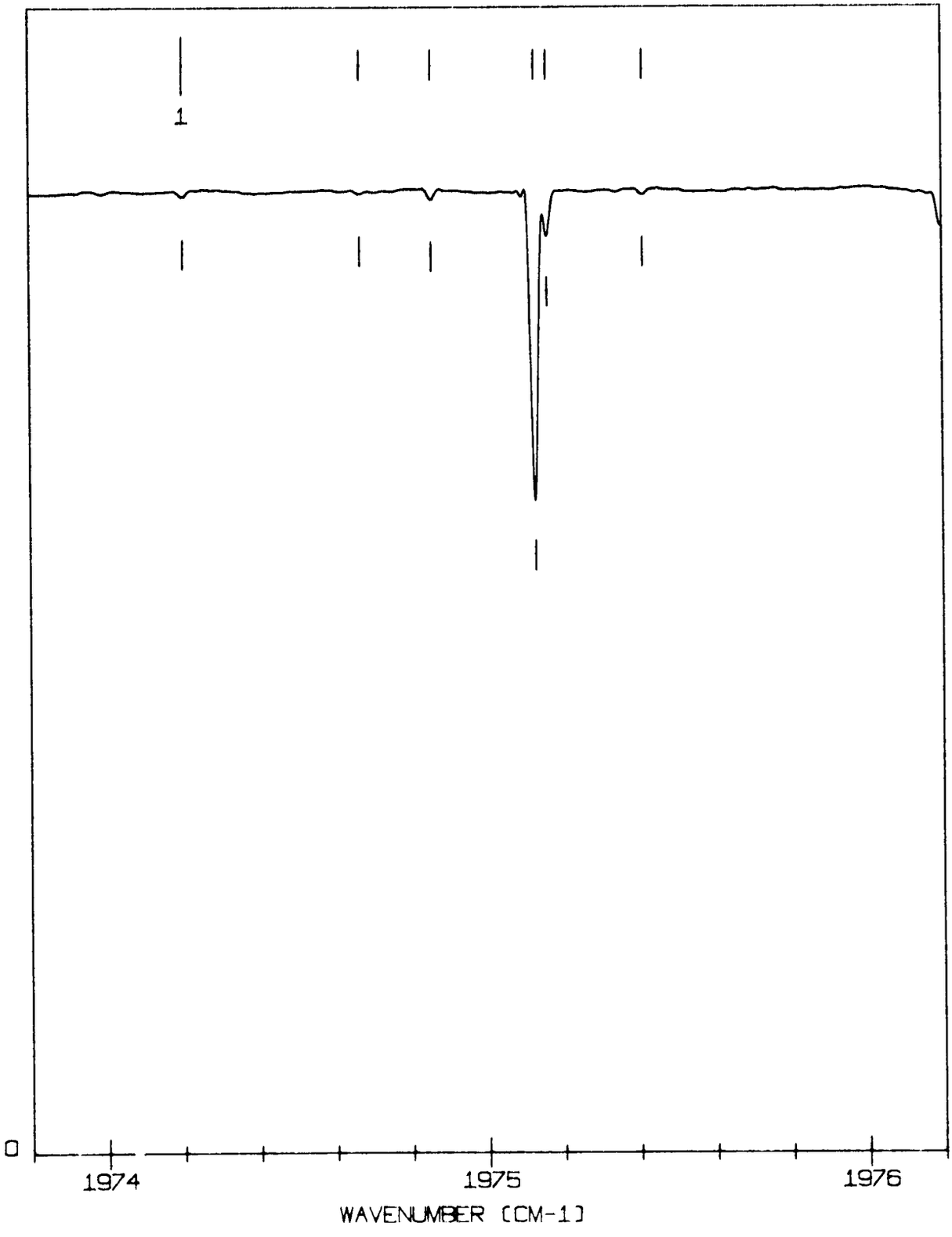


TABLE A74

Line Positions and Identifications (1976-1978 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1976.19814		H2O	
2	1976.51399	1976.51371	20002-01101 636	P25
3	1976.64297		?	
4	1976.77559	1976.77559	11102-00001 626	R54
5	1976.86387	1976.86408	20002-01101 626	P33
6	1977.62897		H2O	
7	1977.88215	1977.88210	21102-02201 626	P33

FRAME A74

9.857 Torr 384 meters

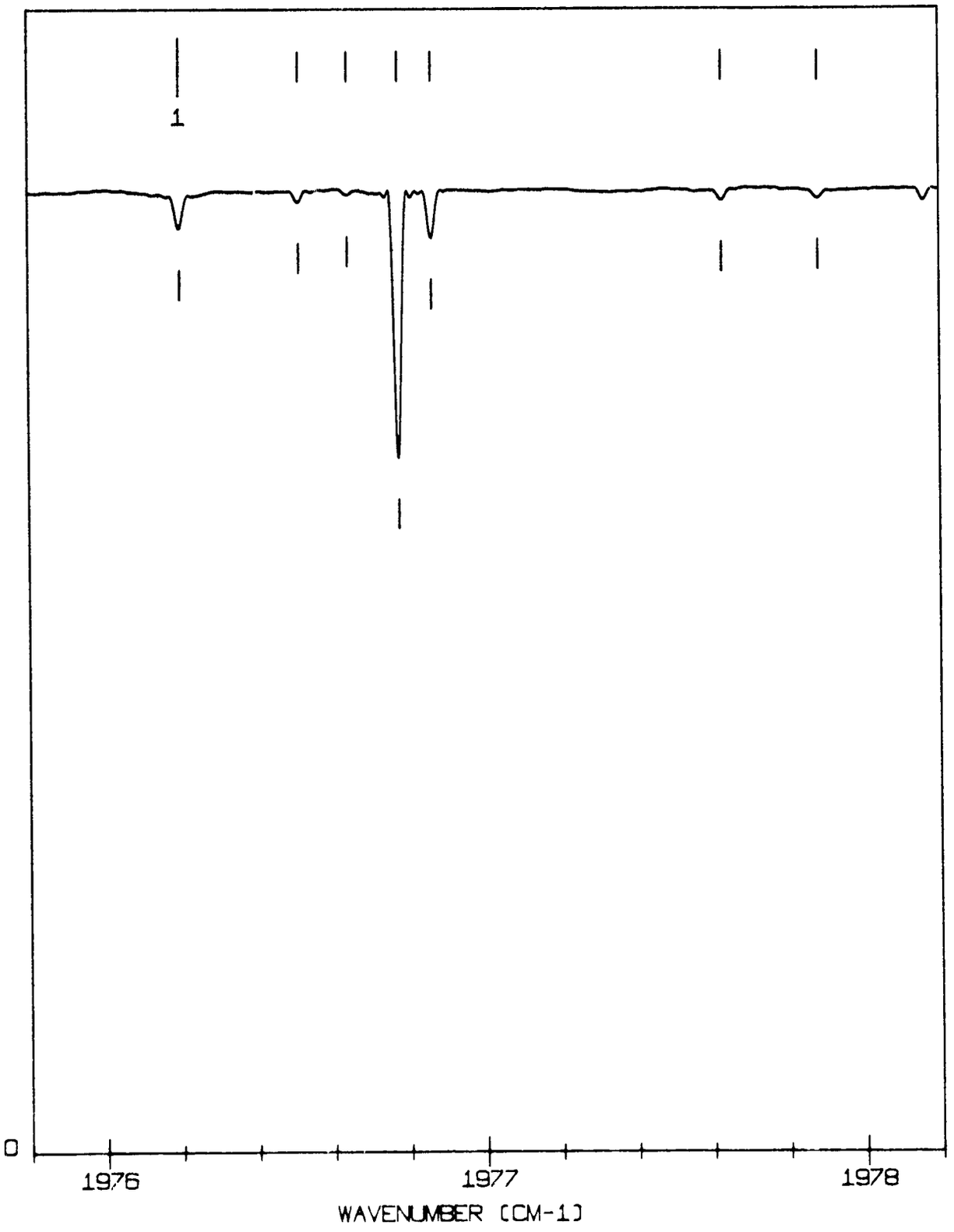


TABLE A75

Line Positions and Identifications (1978-1980 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1978.16059	1978.16079	20002-01101 636	P23
2	1978.42282	1978.42275	11102-00001 626	R56
3	1978.55824	1978.55872	20002-01101 626	P31
4	1978.72959	1978.72955	11101-00001 636	P74
5	1979.14574		?	
6	1979.32026	1979.32036	21102-02201 626	P30
7	1979.49699	1979.49932	21102-02201 626	P31
8	1979.79955	1979.80050	20002-01101 636	P21

FRAME A75

9.857 Torr 384 meters

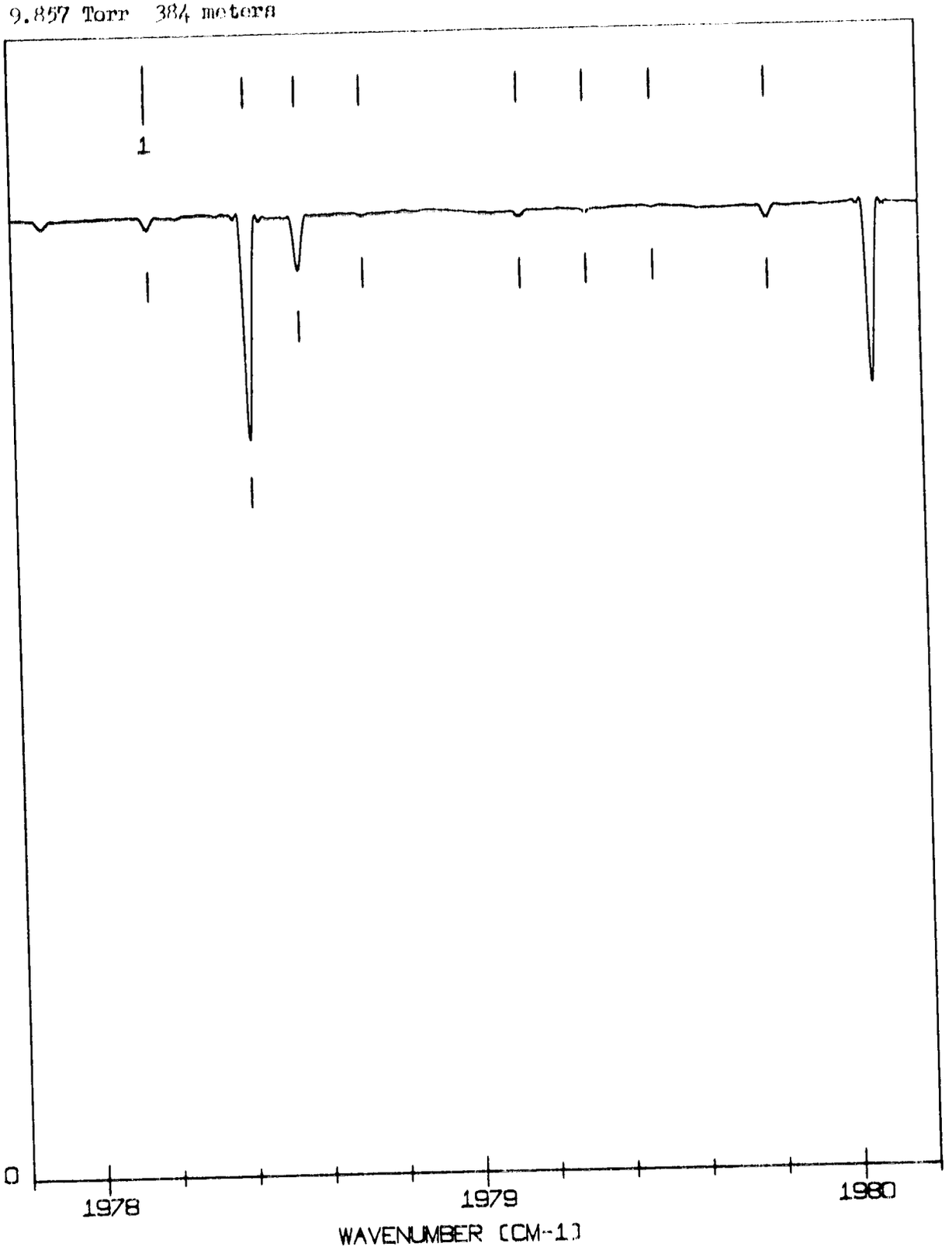


TABLE A76

Line Positions and Identifications (1980-1982 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1980.07093	1960.07096	11102-00001	626	R58
2	1980.24518	1980.24522	20002-01101	626	P29
3	1980.30525	1980.30733	11101-00001	636	P72
4	1980.42403		?		
5	1980.52272		?		
6	1980.76200		H2O		
7	1981.07045	1981.07026	21102-02201	626	P28
8	1981.11898	1981.11953	21102-02201	626	P29
9	1981.33011		H2O		
10	1981.43347	1981.43289	20002-01101	636	P19
11	1981.72001	1981.72004	11102-00001	626	R60
12	1981.88689	1981.88638	11101-00001	636	P70
13	1981.92383	1981.92354	SIDELOBE 20002-01101	626	P27
14	1981.99001		H2O		

FRAME A76

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0.857 Torr 884 meters

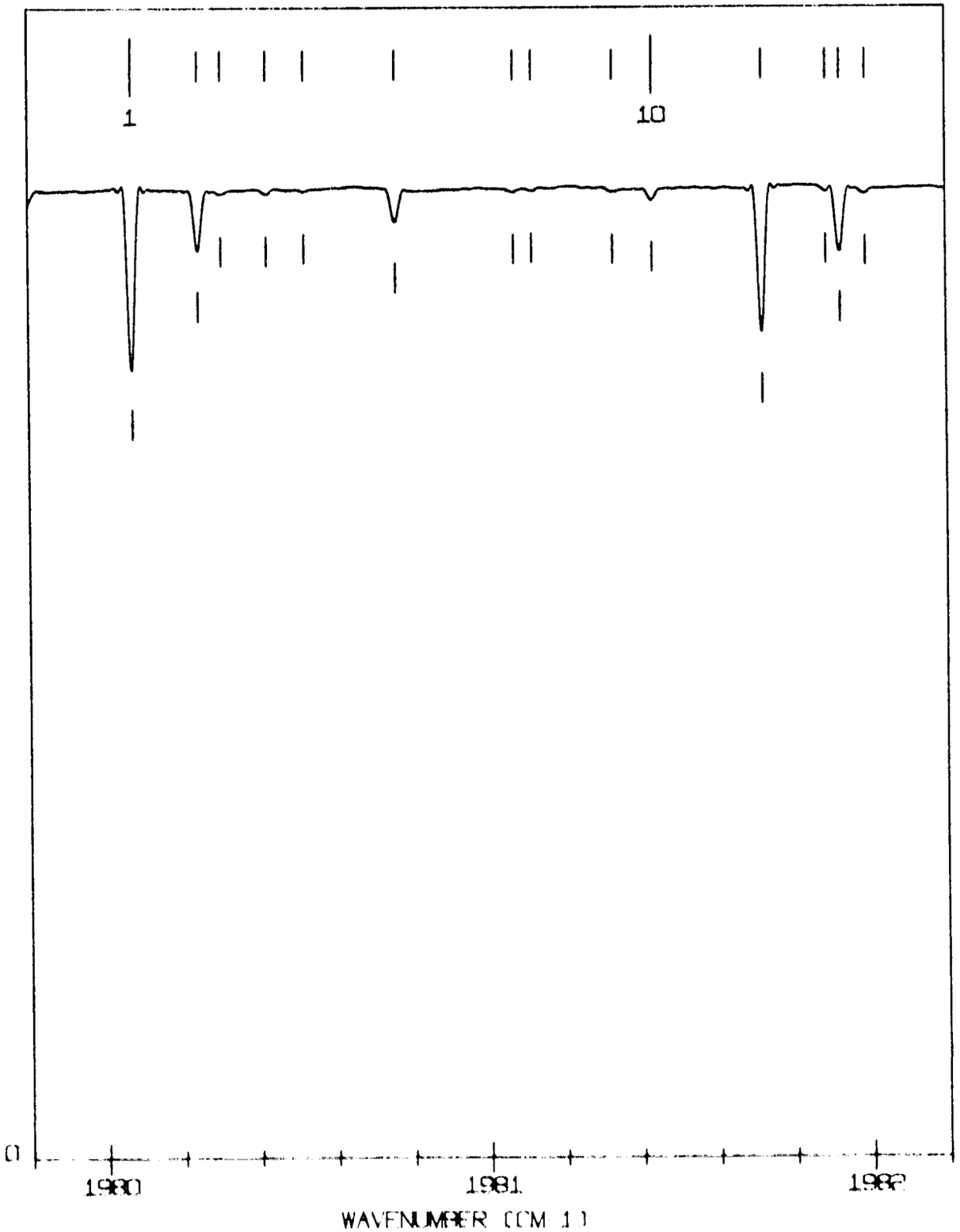

TABLE A77

Line Positions and Identifications (1982-1984 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1982.70759		H2O	
2	1982.73877	1982.73938	21102-02201 626	P27
3	1982.80613	1982.80837	21102-02201 626	P26
4	1983.05866	1983.05801	20002-01101 636	P17
			H2O	
5	1983.36980	1983.36979	11102-00001 626	R62
6	1983.46665	1983.46655	11101-00001 636	P68
7	1983.59373	1983.59366	20002-01101 626	P25

FRAME A77

9.857 Torr 384 meters

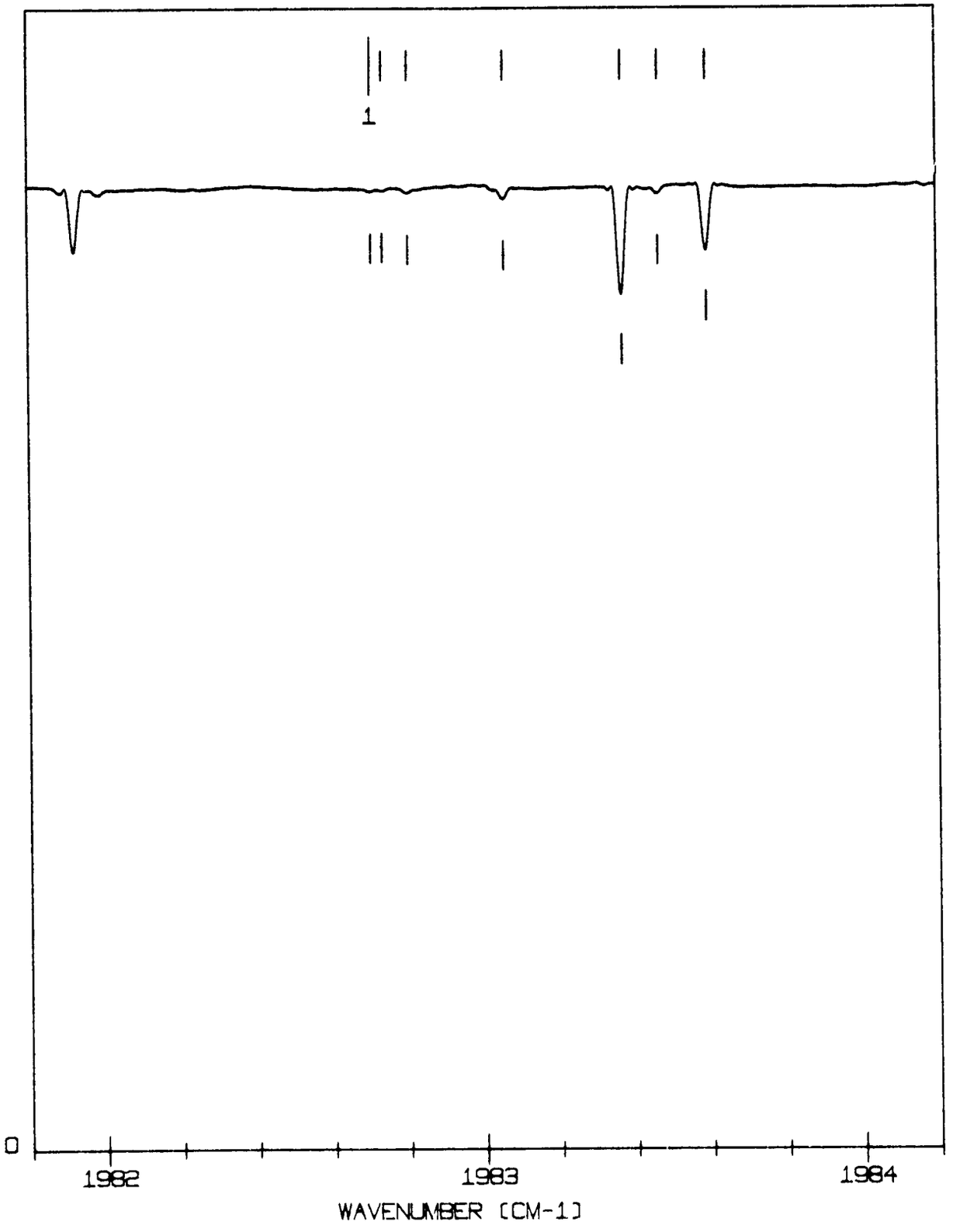

TABLE A78

Line Positions and Identifications (1984-1986 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1984.17116	1984.17077	11101-00001	638	P29
2	1984.35670	1984.35635	21102-02201	626	P25
3	1984.67489	1984.67591	20002-01101	636	P15
4	1984.77406		?		
5	1985.01974	1985.02001	11102-00001	626	R64
6	1985.05014	1985.04768	11101-00001	636	P66
			SIDELOBE		
7	1985.25545	1985.25552	20002-01101	626	P23
8	1985.63259	1985.63073	11101-00001	638	P27
9	1985.71276		?		
10	1985.96556	1985.96878	21102-02201	626	P23
11	1985.99905		H2O		

FRAME A78

9.857 Torr 384 meters

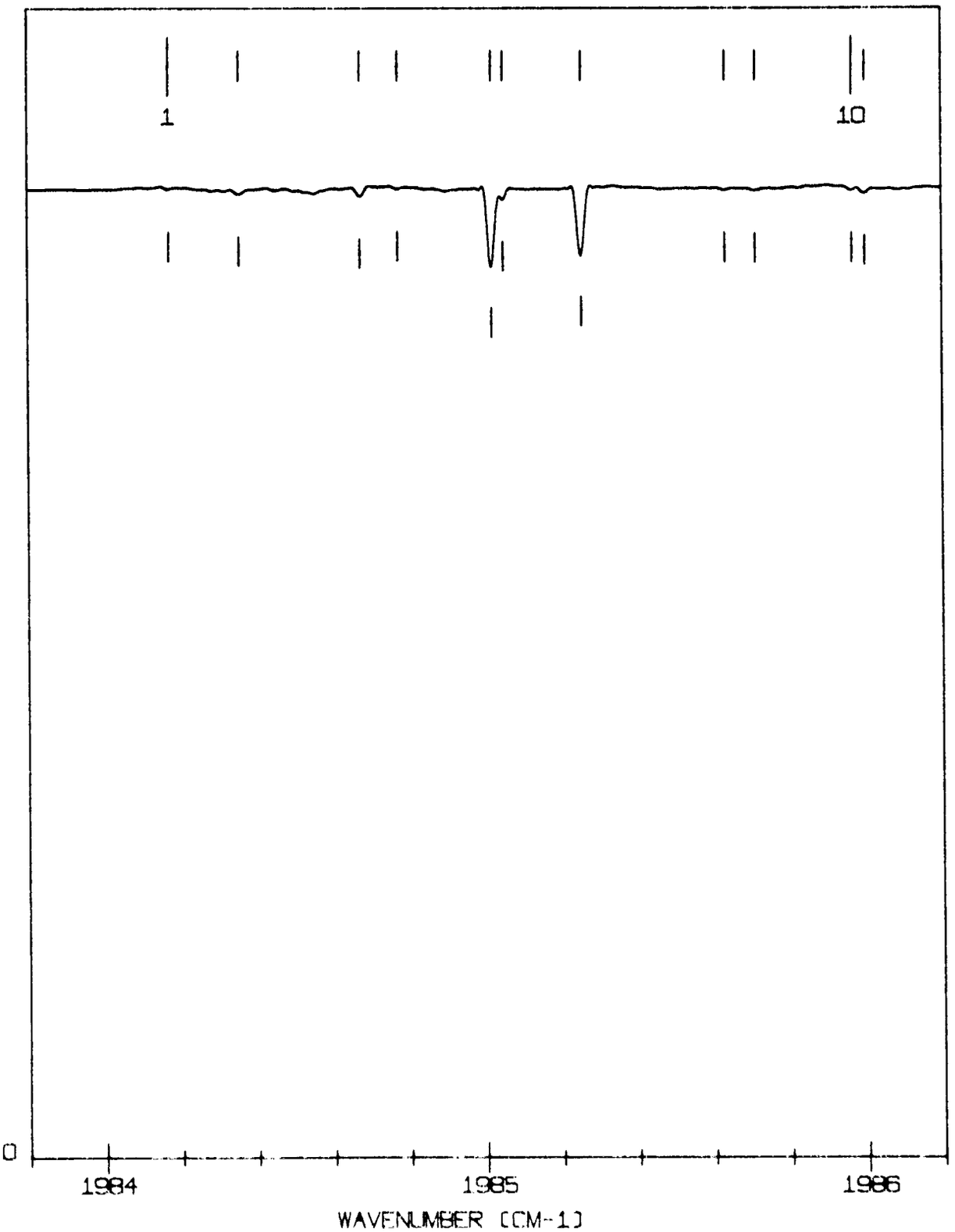

TABLE A79

Line Positions and Identifications (1986-1988 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1986.24567	1986.24522	21102-02201 626	P22
2	1986.28769	1986.28666	20002-01101 636	P13
3	1986.35940	1986.36119	11101-00001 638	P26
4	1986.47620		?	
5	1986.62948	1986.62963	11101-00001 636	P64
6	1986.67036	1986.67052	11102-00001 626	R66
7	1986.90907	1986.90908	20002-01101 626	P21
8	1987.08796	1987.09197	11101-00001 638	P25
9	1987.15324		H2O	
10	1987.33992		H2O	
11	1987.57111	1987.57581	21102-02201 626	P21
12	1987.82453	1987.82307	11101-00001 638	P24
13	1987.89031	1987.89031	20002-01101 636	P11
14	1987.94142	1987.94327	21102-02201 626	P20

FRAME A79

0.857 Torr 884 meters

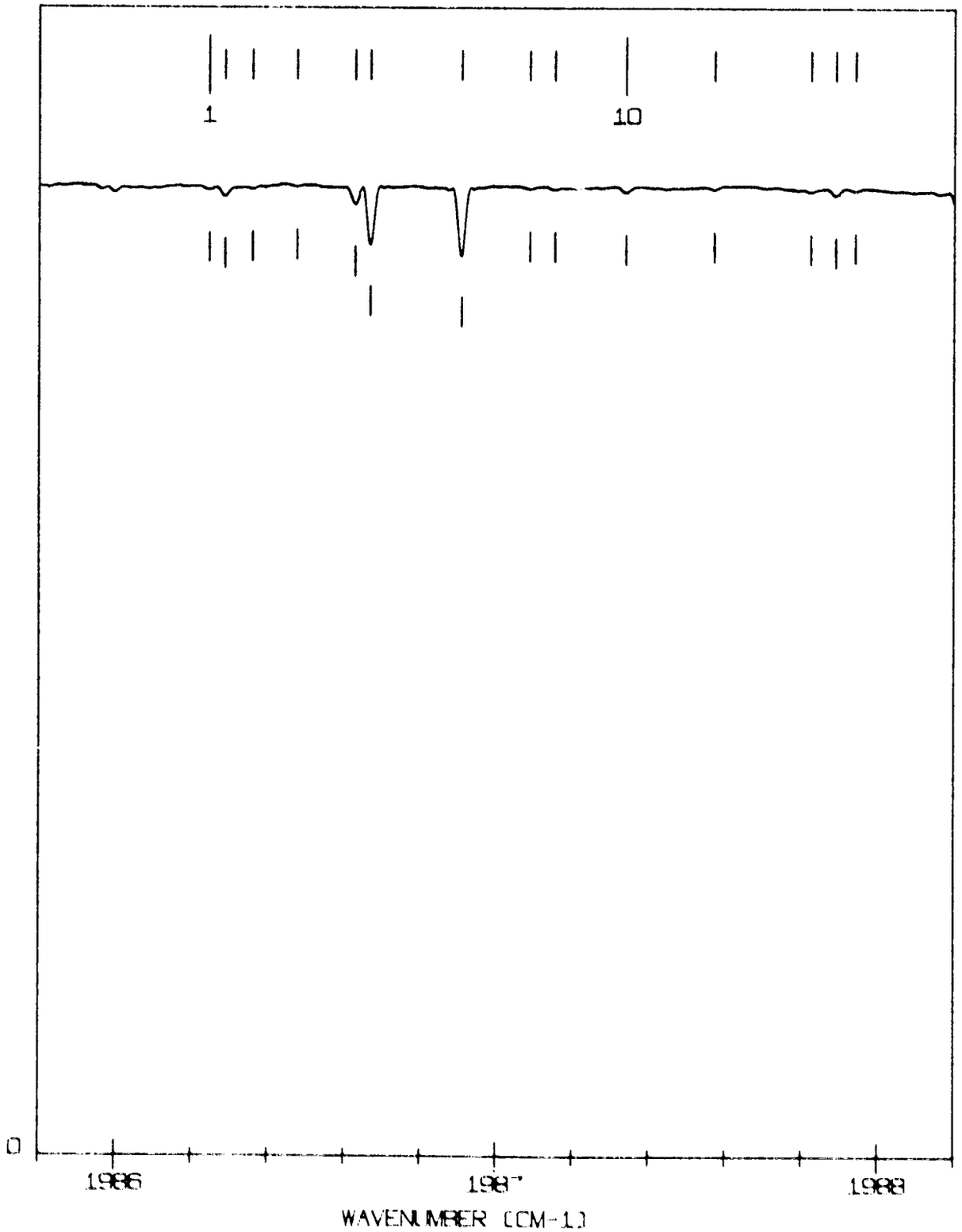

TABLE A80

Line Positions and Identifications (1988-1990 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1988.21302	1988.21226	11101-00001 636	P62
2	1988.32307	1988.32110	11102-00001 626	R68
3	1988.39551		H2O	
4	1988.55385	1988.55433	20002-01101 626	P19
		1988.55449	11101-00001 638	P23
5	1989.17701	1989.17743	21102-02201 626	P19
6	1989.28460	1989.28624	11101-00001 638	P22
7	1989.48717	1989.48691	20002-01101 636	P9
8	1989.53321		?	
9	1989.62817	1989.62812	21102-02201 626	P18
10	1989.79542	1989.79543	11101-00001 636	P60
11	1989.97177	1989.97155	11102-00001 626	R70

FRAME A80

9.857 Torr 384 meters

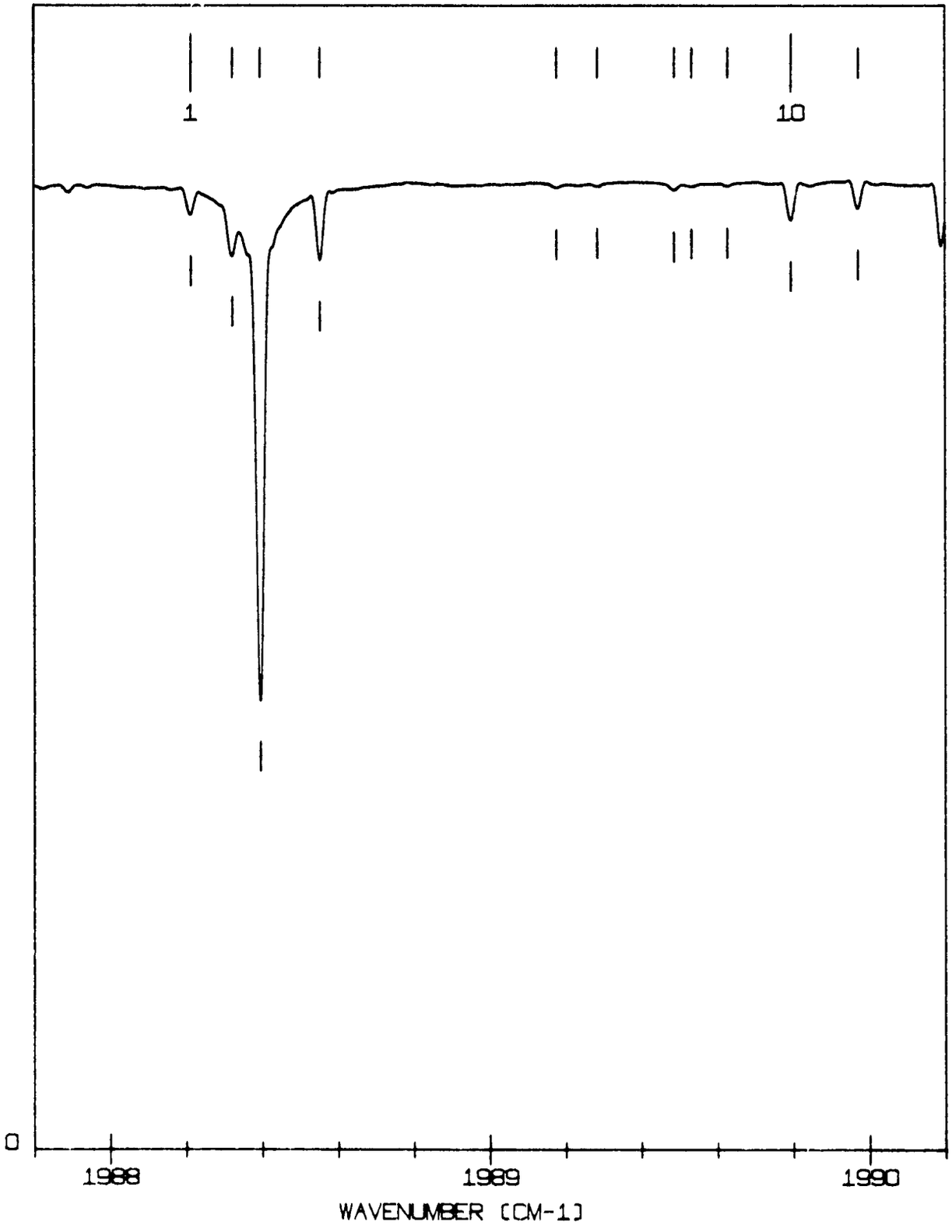

TABLE A81

Line Positions and Identifications (1990-1992 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1990.01975	1990.01830	11101-00001 638	P21
			SIDELOBE	
2	1990.19142	1990.19121	20002-01101 626	P17
3	1990.75207	1990.75068	11101-00001 638	P20
4	1990.77469	1990.77447	21102-02201 626	P17
5	1991.07500	1991.07654	20002-01101 636	P7
6	1991.30149	1991.30071	21102-02201 626	P16
7	1991.37911	1991.37902	11101-00001 636	P58
8	1991.48324	1991.48339	11101-00001 638	P19
9	1991.51771		?	
10	1991.62193	1991.62166	11102-00001 626	R72
11	1991.88619		H20	
		1991.81970	20002-01101 626	P15

FRAME A81

9.857 Torr 384 meters

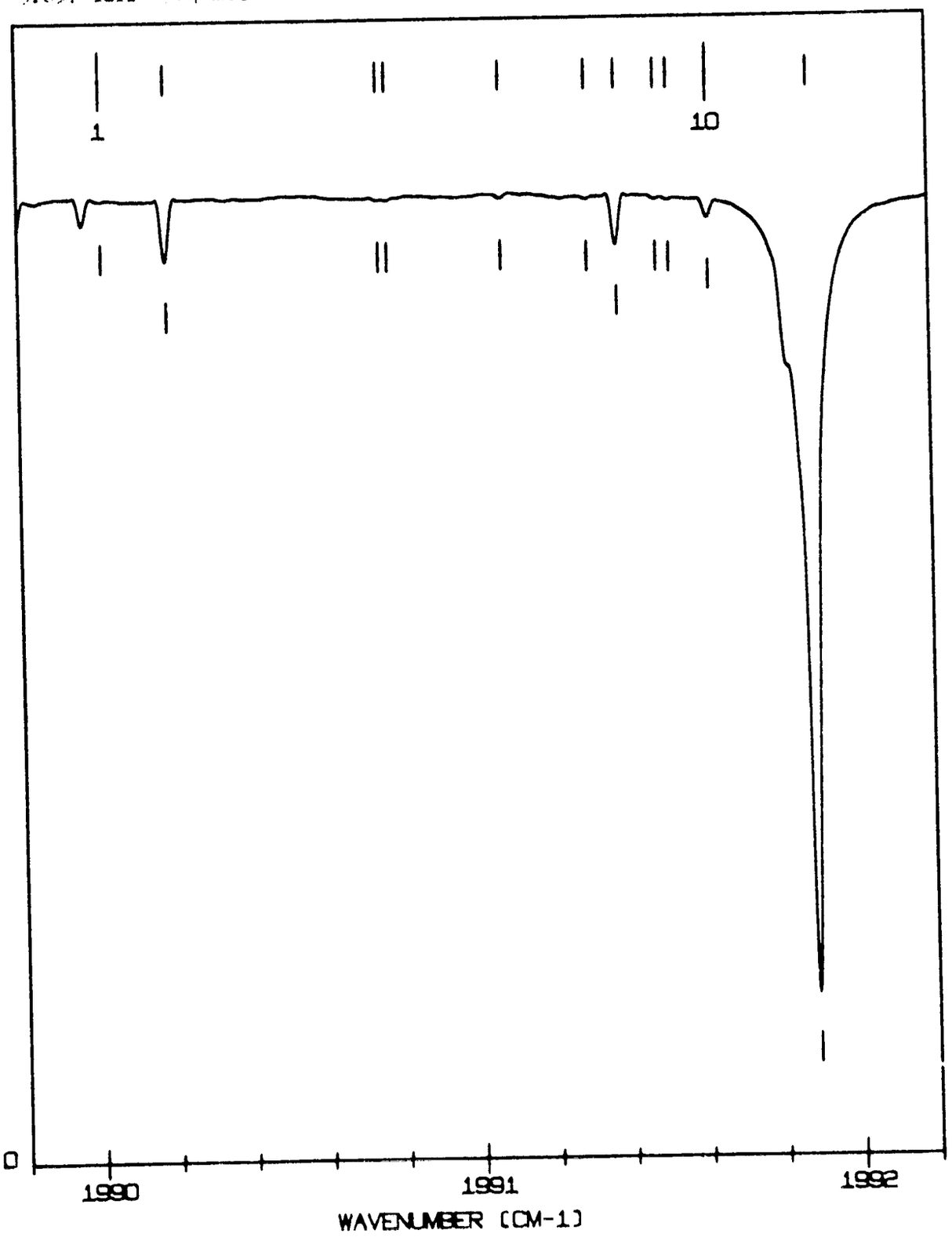

TABLE A82

Line Positions and Identifications (1992-1994 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1992.21659	1992.21641	11101-00001 638	P18
2	1992.38794		H2O	
		1992.36856	21102-02201 626	P15
3	1992.65044		H2O	
		1992.65925	20002-01101 636	P5
4	1992.96269	1992.96290	11101-00001 636	P56
		1992.96249	21102-02201 626	P14
		1992.94976	11101-00001 638	P17
5	1993.25798		H2O	
		1993.27122	11102-00001 626	R74
6	1993.43976	1993.43977	20002-01101 626	P13
7	1993.68288	1993.68342	11101-00001 638	P16
8	1993.96592	1993.96221	21102-02201 626	P13

FRAME A82

9.857 Torr 384 meters

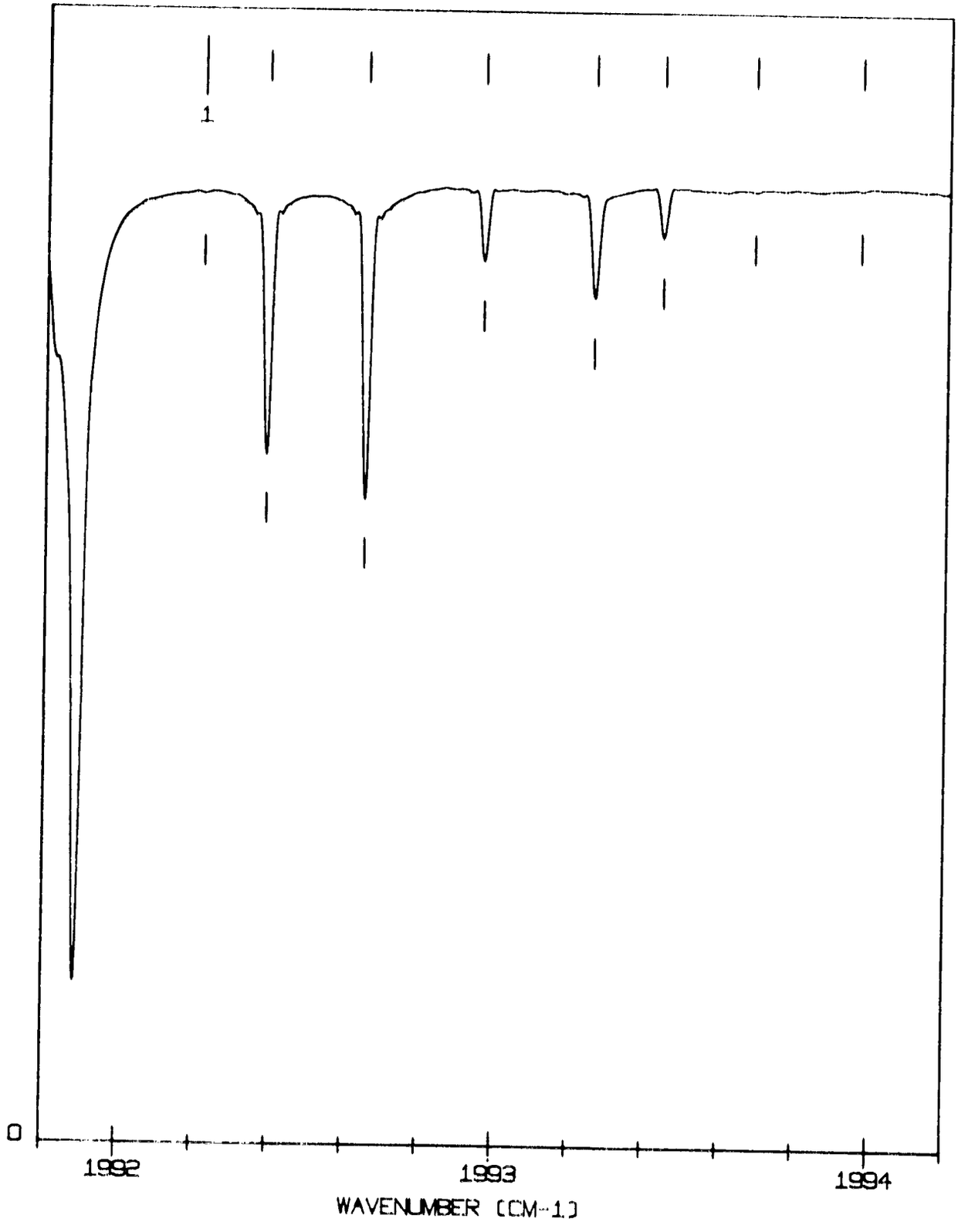

TABLE A83

Line Positions and Identifications (1994-1996 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1994.41741	1994.41741	11101-00001	638	P15
2	1994.54696	1994.54696	11101-00001	636	P54
3	1994.61531	1994.61541	21102-02201	626	P12
4	1994.73627	1994.73945	20002-01101	636	Q34
5	1994.82929		?		
6	1994.91835	1994.92000	11102-00001	626	R76
7	1994.94584	1994.94769	20002-01101	636	Q32
8	1995.05109	1995.05138	20002-01101	626	P11
9	1995.14429	1995.14338	20002-01101	636	Q30
10	1995.32596	1995.32655	20002-01101	636	Q28
11	1995.49868	1995.49722	20002-01101	636	Q26
12	1995.55573	1995.55873	21102-02201	626	P11
13	1995.65449	1995.65540	20002-01101	636	Q24
14	1995.80341	1995.80111	20002-01101	636	Q22
15	1995.93450	1995.93437	20002-01101	636	Q20

FRAME A83

0.857 Torr 384 meters

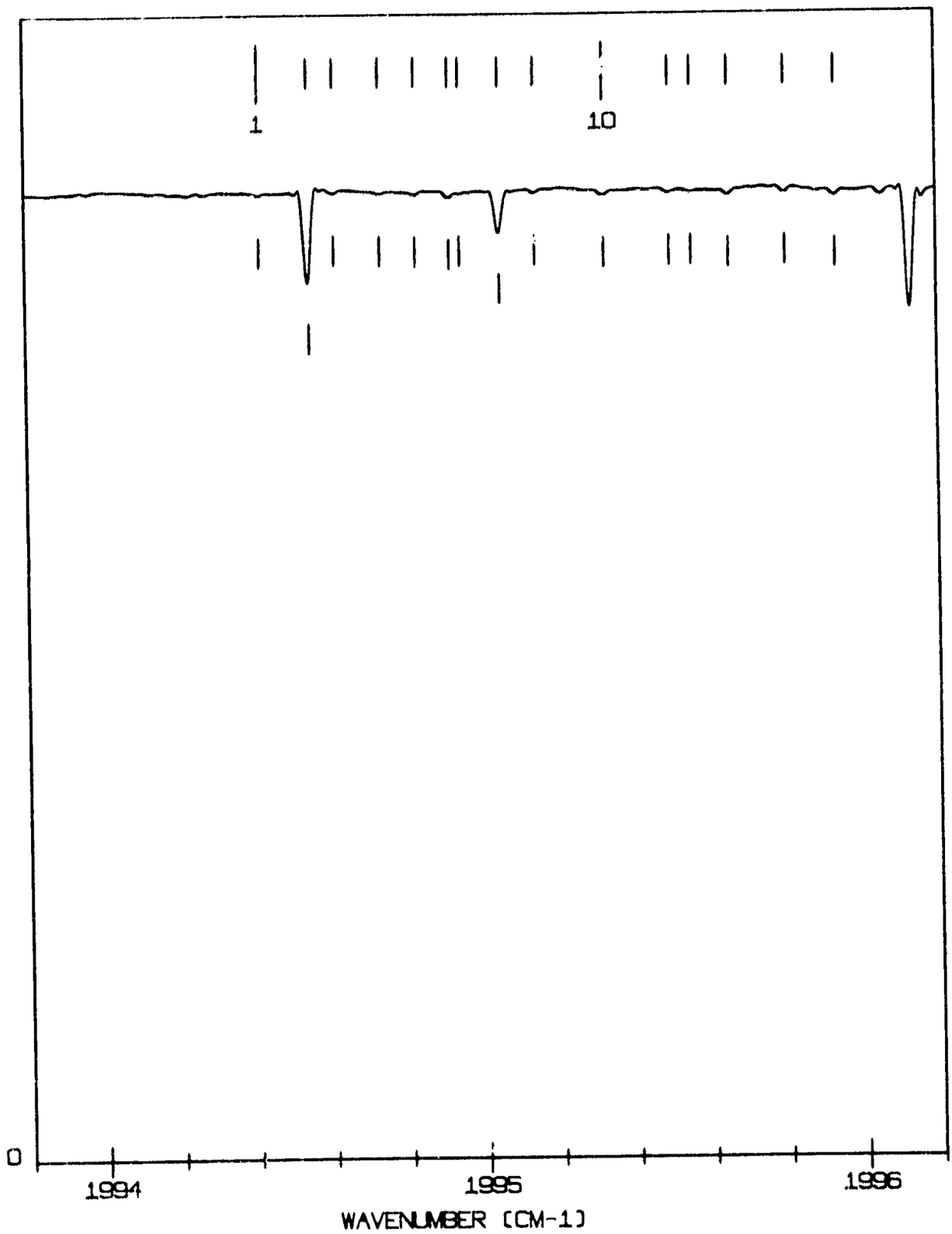

TABLE A84

Line Positions and Identifications (1996-1998 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION		
1	1996.05564	1996.05519	20002-01101	636	Q18
2	1996.13130	1996.13109	11101-00001	636	P52
3	1996.16521	1996.16359	20002-01101	636	Q16
			SIDELOBE		
4	1996.25550	1996.25957	20002-01101	636	Q14
		1996.26196	21102-02201	626	P10
5	1996.29702	1996.29706	21102-10002	636	P34
6	1996.34154	1996.34314	20002-01101	636	Q12
7	1996.41355	1996.41431	20002-01101	636	Q10
8	1996.47331	1996.47310	20002-01101	636	Q8
9	1996.52021	1996.51951	20002-01101	636	Q6
10	1996.56713	1996.55353	20002-01101	636	Q4
		1996.56779	11102-00001	626	R78?
11	1996.65421	1996.65451	20002-01101	626	P9
12	1997.71518	1997.71519	11101-00001	636	P50
13	1997.97336	1997.97262	21102-10002	636	P32

FRAME A84

0.367 Torr 84 meters

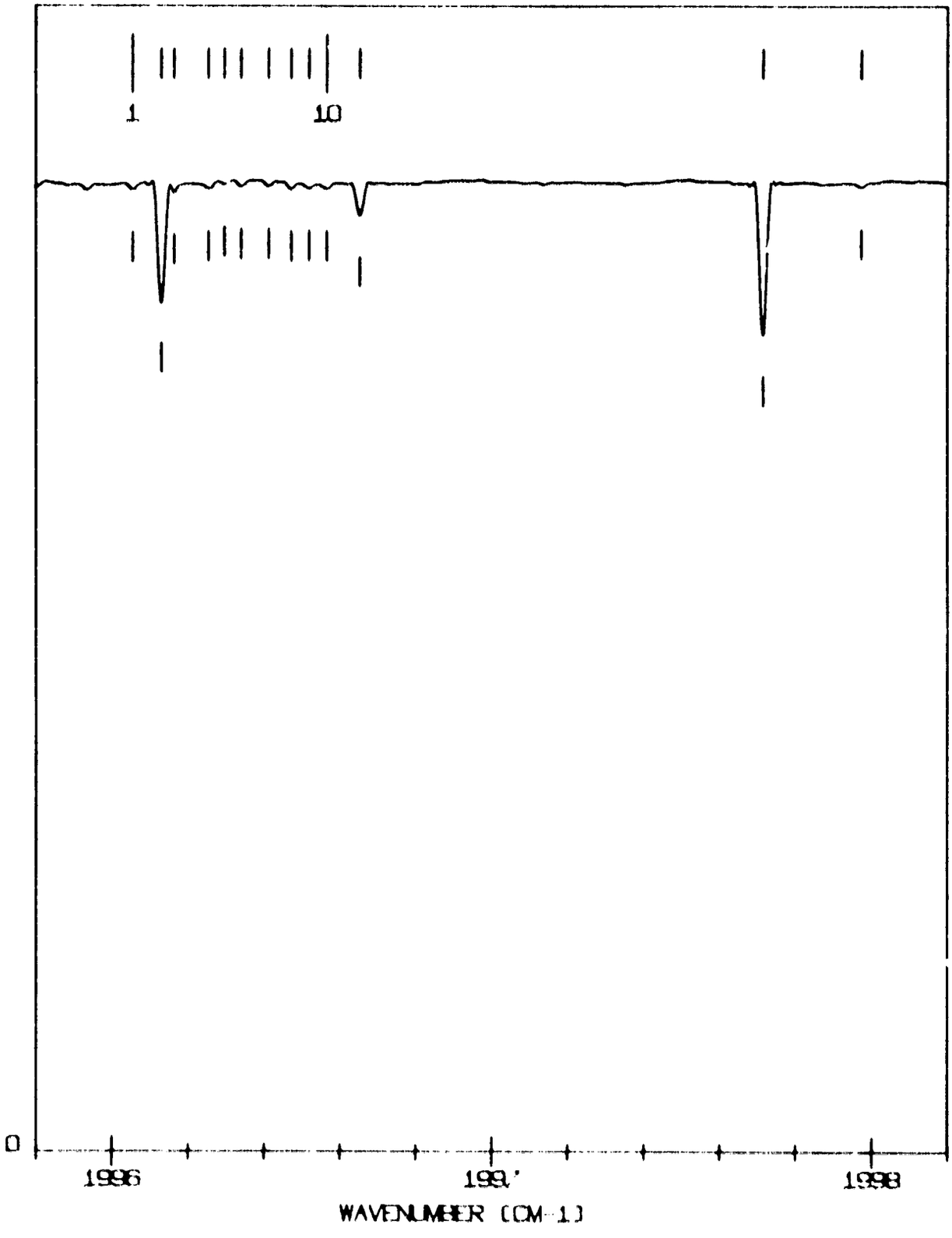

TABLE A85

Line Positions and Identifications (1998-2000 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	1998.21472	1998.21437	11102-00001 626	R80
2	1998.24916	1998.24913	20002-01101 626	P7
3	1998.72034		?	
4	1998.92398		H2O	
5	1999.29918	1999.29916	11101-00001 636	P48
6	1999.64263	1999.64238	21102-10002 636	P30
7	1999.83515	1999.83522	20002-01101 626	P5
8	1999.94516		H2O	

FRAME A85

9.857 Torr 384 meters

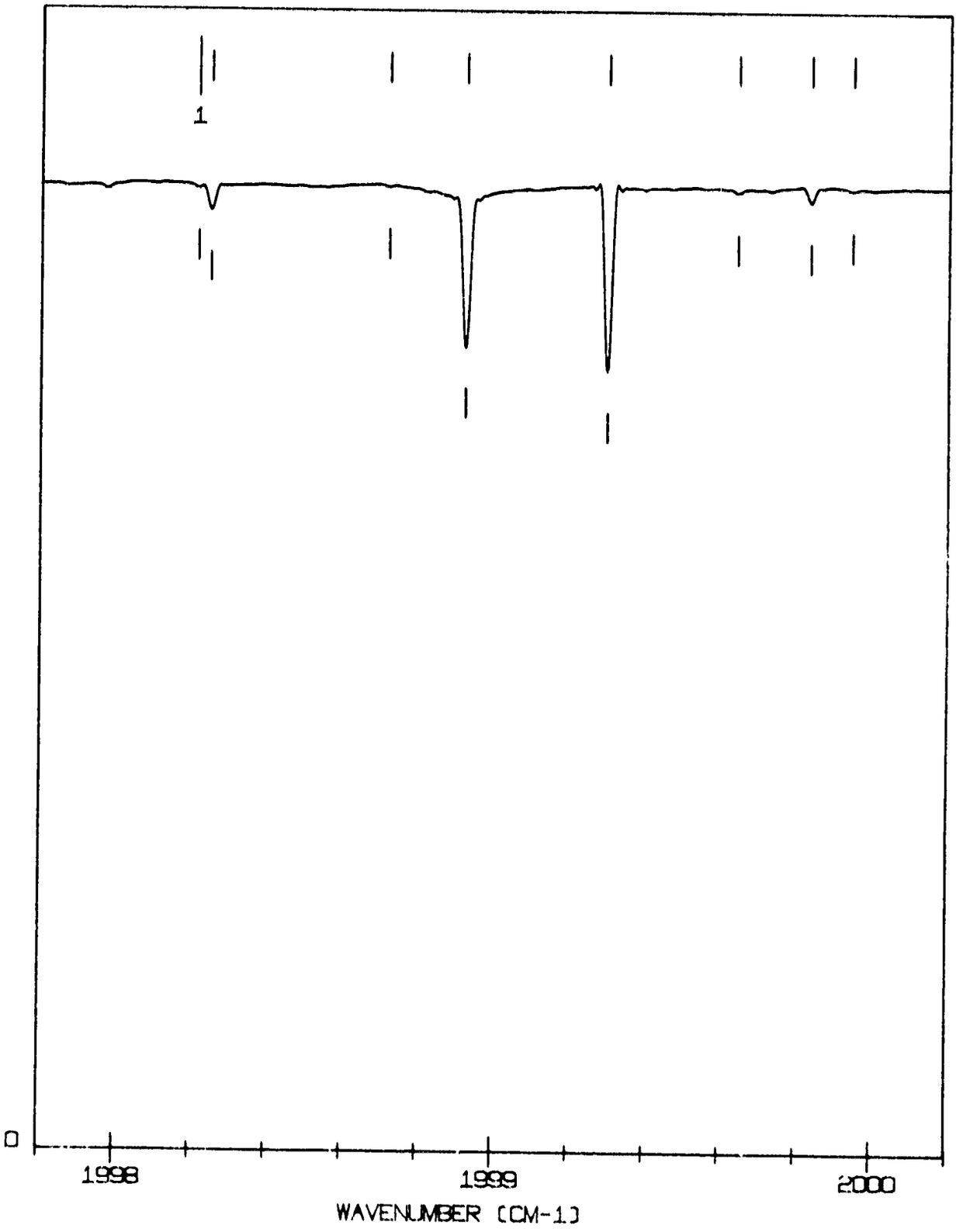

TABLE A86

Line Positions and Identifications (2000-2002 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	2000.88292	2000.88291	11101-00001 636	P46
2	2000.99255	2000.99213	20002-01101 626	Q40
3	2001.01819	2001.02000	21102-10002 626	P66
4	2001.25847	2001.25843	20002-01101 626	Q38
5	2001.30544	2001.30559	21102-10002 636	P28
6	2001.41289	2001.41274	20002-01101 626	P3
7	2001.50960	2001.51142	20002-01101 626	Q36
8	2001.75146	2001.75108	20002-01101 626	Q34
9	2001.97747	2001.97738	20002-01101 626	Q32

FRAME A86

0.857 Torr 384 meters

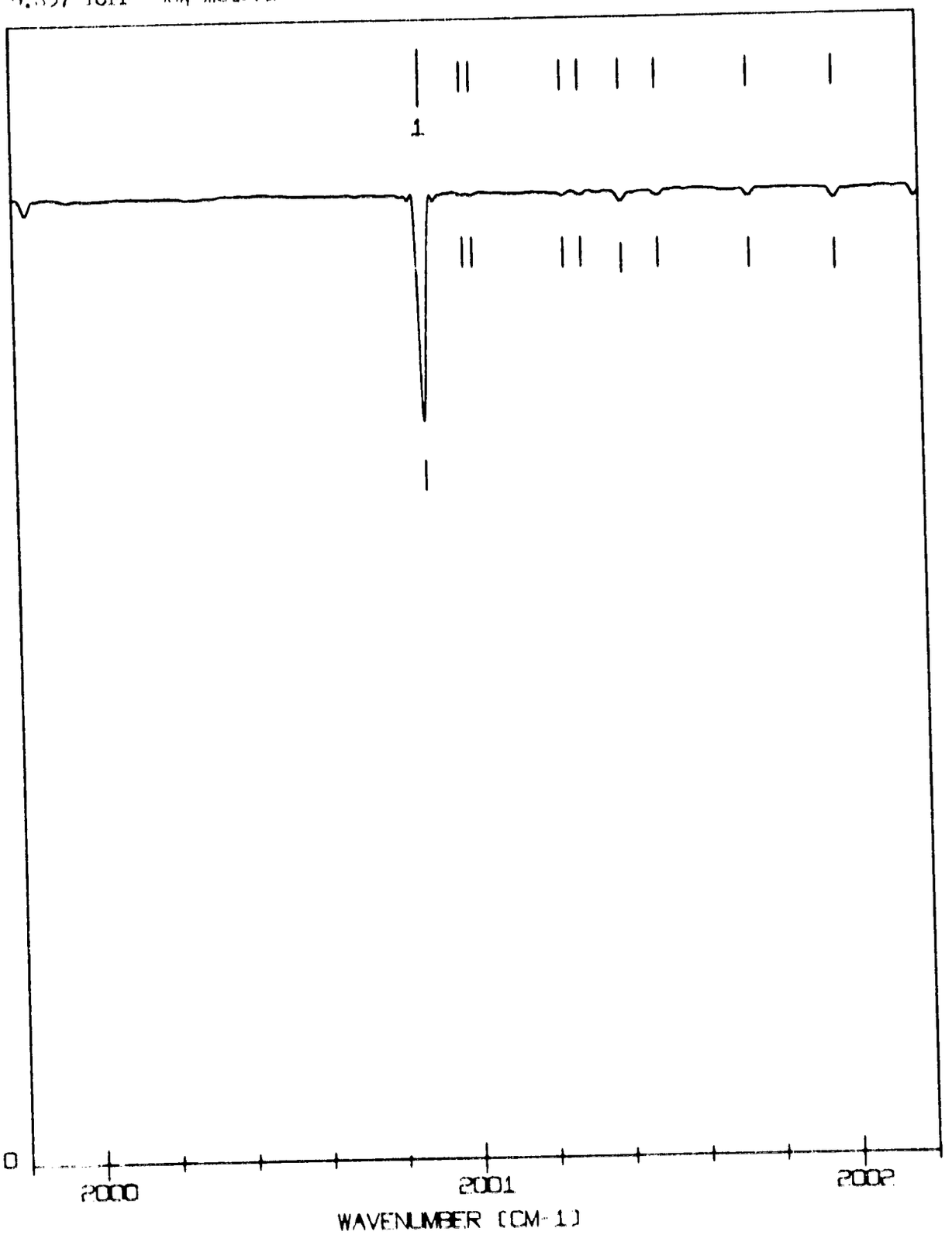

TABLE A87

Line Positions and Identifications (2002-2004 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	2002.19063	2002.19028	20002-01101 626	Q30
2	2002.38958	2002.38976	20002-01101 626	Q28
3	2002.46630	2002.46636	11101-00001 636	P44
4	2002.57607	2002.57577	20002-01101 626	Q26
5	2002.63931	2002.63914	21102-10002 626	P64
6	2002.74817	2002.74829	20002-01101 626	Q24
7	2002.90696	2002.90730	20002-01101 626	Q22
8	2002.97001	2002.96187	21102-10002 636	P26
			?	
9	2003.05266	2003.05278	20002-01101 626	Q20
10	2003.18515	2003.18471	20002-01101 626	Q18
11	2003.30301	2003.30309	20002-01101 626	Q16
12	2003.40804	2003.40792	20002-01101 626	Q14
13	2003.49922	2003.49921	20002-01101 626	Q12
14	2003.57658	2003.57695	20002-01101 626	Q10
15	2003.64057	2003.64116	20002-01101 626	Q8
16	2003.69273	2003.69184	20002-01101 626	Q6
17	2003.72933	2003.72899	20002-01101 626	Q4
18	2003.75241	2003.75264	20002-01101 626	Q2
19	2003.82972		?	

FRAME A87

9.857 Torr 384 meters

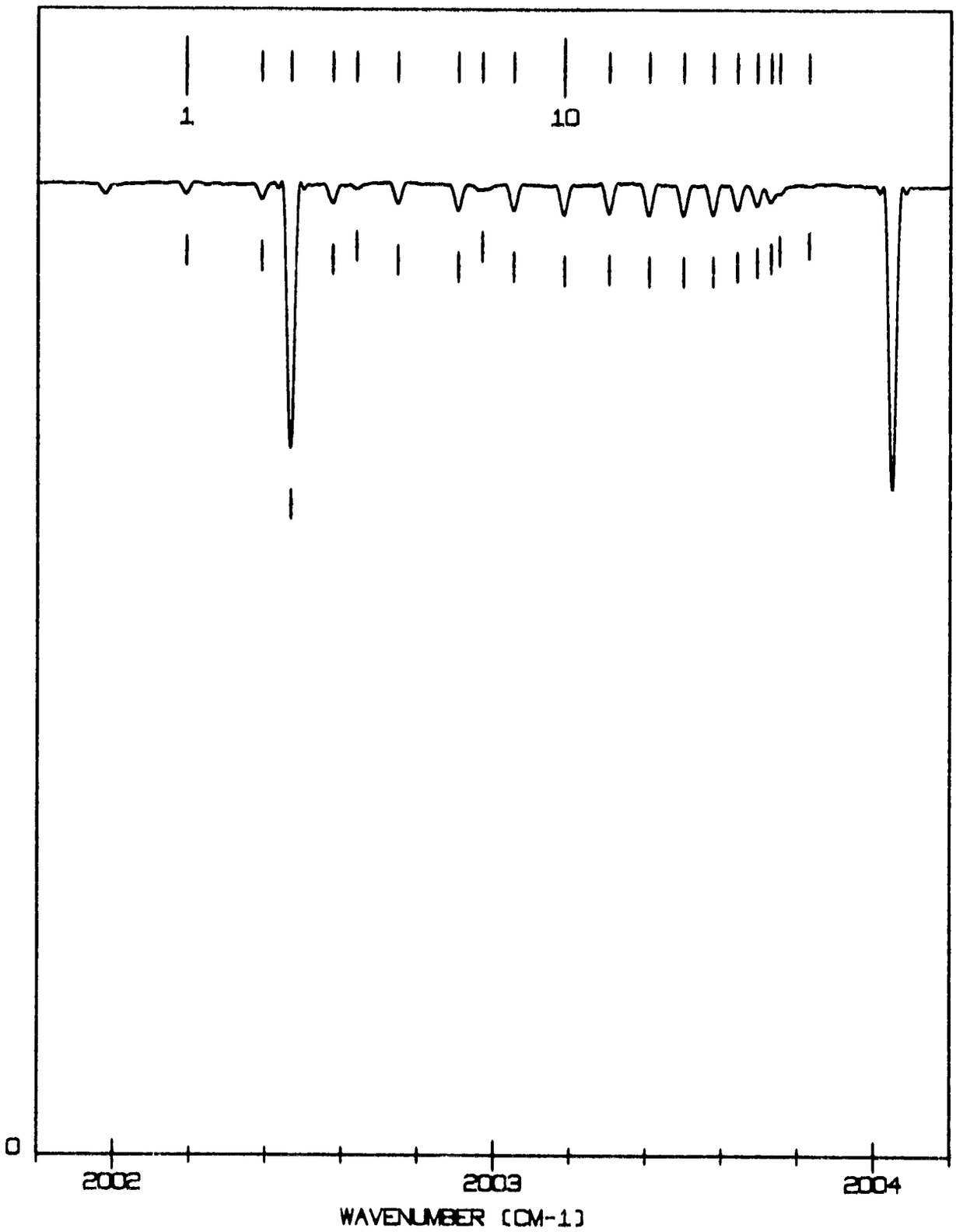

TABLE A88

Line Positions and Identifications (2004-2006 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	2004.04943	2004.04942	11101-00001 636	P42
2	2004.26107	2004.25957	21102-10002 626	P62
3	2004.61174	2004.61120	21102-10002 636	P24
4	2004.82118	2004.81988	12201-01101 636	P60
5	2004.90589	2004.90626	11101-00001 628	P63
6	2005.24769		?	
7	2005.51681		?	
8	2005.57536	2005.57552	11101-00001 628	P62
9	2005.63249	2005.63203	11101-00001 636 H2O	P40
10	2005.88054	2005.88129	21102-10002 626	P60

FRAME A88

0.857 Torr 384 meters

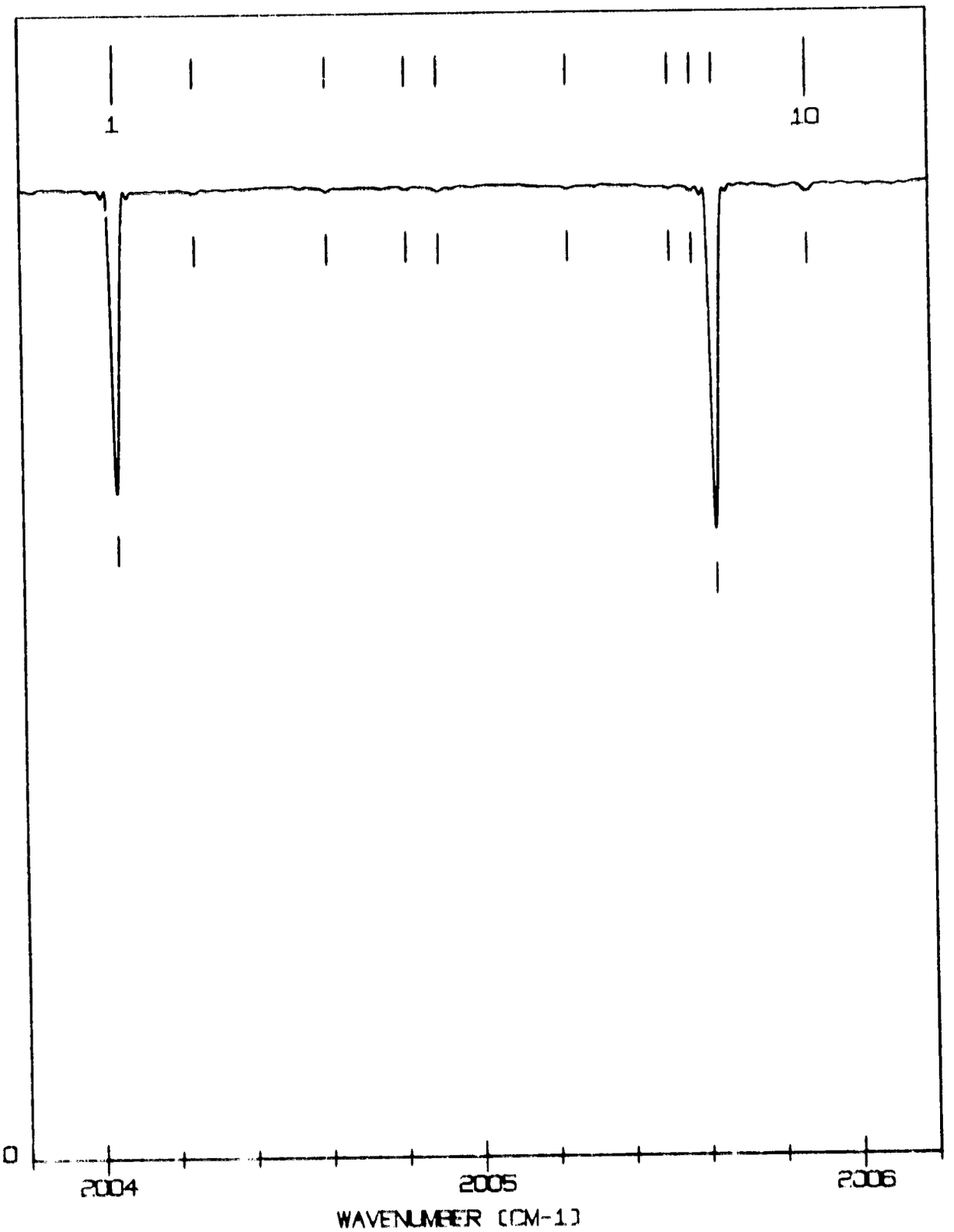

TABLE A89

Line Positions and Identifications (2006-2008 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	2006.24924	2006.24606	11101-00001 628	P61
		2006.25395	21102-10002 636	P22
2	2006.35689	2006.35603	12201-01101 636	P61
3	2006.37489	2006.37671	12201-01101 636	P58
4	2006.86723	2006.86635	20002-01101 626	R3
5	2006.91875	2006.91789	11101-00001 628	P60
6	2007.21410	2007.21413	11101-00001 636	P38
7	2007.50425	2007.50429	21102-10002 626	P58
8	2007.59050	2007.59099	11101-00001 628	P59
9	2007.69993		H2O	
10	2007.76774	2007.77058	12201-01101 636	P59
11	2007.89027	2007.89086	21102-10002 636	P20
12	2007.93309	2007.93495	12201-01101 636	P56

FRAME 489

9.857 Torr 384 meters

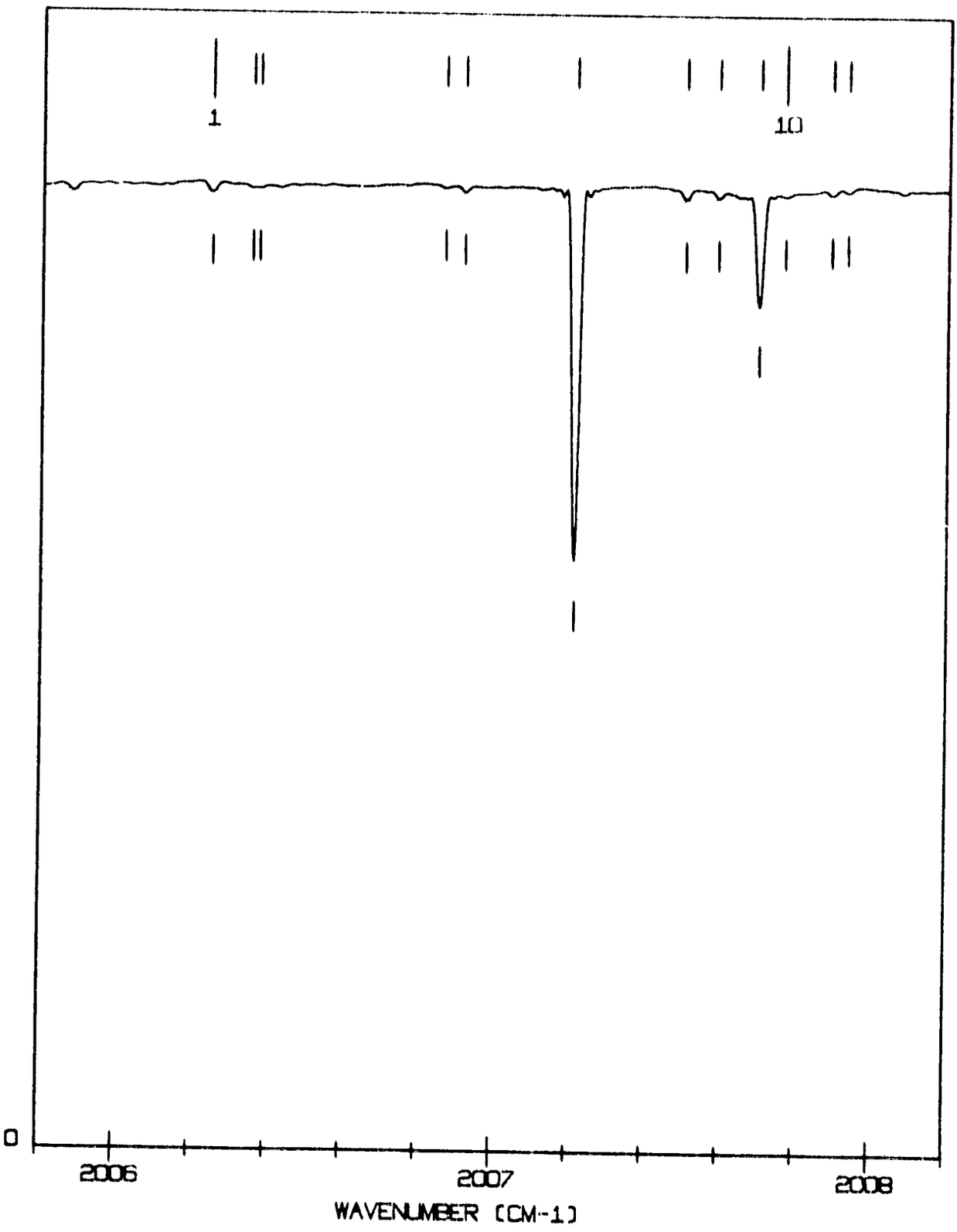

TABLE A90

Line Positions and Identifications (2008-2010 cm^{-1})

LINE NO	OBSERVED POSITION	CALCULATED POSITION	IDENTIFICATION	
1	2008.07886		H2O?	
2	2008.26465	2008.26538	11101-00001 628	P58
3	2008.35784		?	
4	2008.40385	2008.40509	20002-01101 626	R5
5	2008.79565	2008.79564	11101-00001 636	P36
6	2008.94110	2008.94107	11101-00001 628	P57
7	2009.12863	2009.12858	21102-10002 626	P56
8	2009.19081	2009.19036	12201-01101 636	P57
9	2009.33347		H2O	
10	2009.49558	2009.49451	12201-01101 636	P54
11	2009.52326	2009.52305	21102-10002 636	P18
12	2009.61823	2009.61803	11101-00001 628	P56
13	2009.93391	2009.93516	20002-01101 626	R7

FRAME A90

9.857 Torr 384 meters